Scientific American.

A JOURNAL OF PRACTICAL INFORMATION IN ART, SCIENCE, MECHANICS, AGRICULTURE, CHEMISTRY, AND MANUFACTURES.

VOL. III.—No. 14. NEW YORK, SEPTEMBER 29, 1860. NEW SERIES.

HYDROPHOBIA.

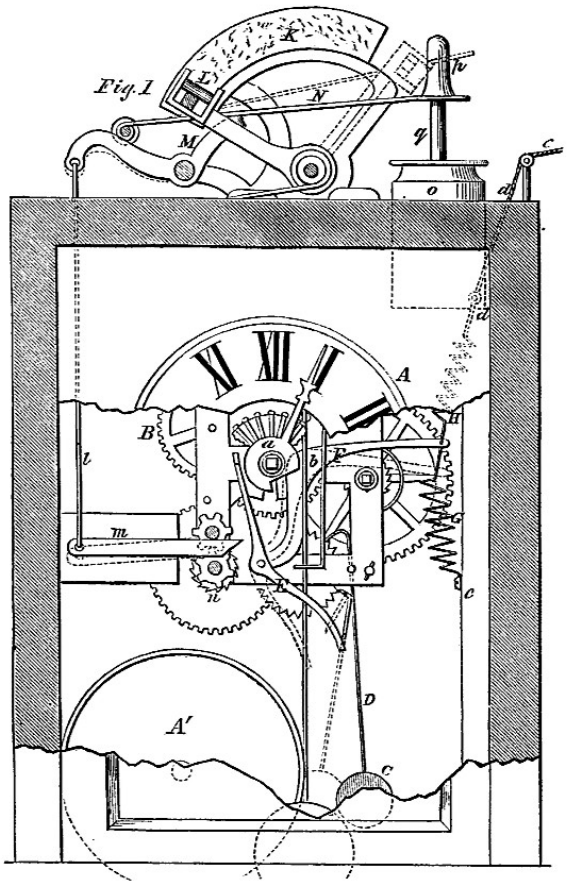
A work has just been issued on the Hydrophobia (Le Meilleur Preservatif de la Rage, Paris, 1860, 8vo., pp. 88), by M. Sanson, whose name is so distinguished among chemists by the discovery of dextrine in the blood of animals. I say hydrophobia, as that is the term generally recognized in America, though M. Sanson considers its use a lamentable error, as leading to the belief that dogs are not mad when they show no horror of water. It appears certain, on the contrary, from many facts adduced by this *savant*, that in the majority of cases, when a dog runs mad, he is seized with a burning thirst, which is often satisfied by drinking abundantly. Other authorities testify to the same fact, especially the English veterinary author, Youatt. Another fact established by M. Sanson is, that an animal may be attacked with the disease, at the same time remaining submissive to his master and even caressing him—which is, indeed, almost always the case, unless he is naturally fierce and intractable. Indeed, the poor brute often appears, by redoubled tokens of affection, to implore the aid of his master to relieve his terrible sufferings. With these caresses, however, may always be observed a downcast guilty look, which is one of the most certain symptoms of the disease.

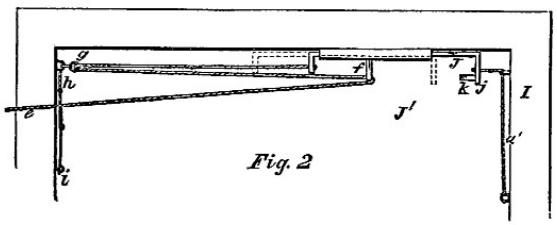
As it is difficult to describe this gloomy look in print, Mr. Sanson has introduced in his book a wood-cut representing, in a very vivid manner, the countenance of a mad dog, A system of the approach of the disease, on which the author lays great stress, is almost constant restlessness, without apparent cause or motive. According to Youatt (whose work M. Sanson praises highly, and from which, indeed, he has taken much of his best matter), the dog runs about to and fro, and is continually getting up and lying down, changing his position in every possible manner. He piles his bed up in a heap, and appears to take great pleasure in resting his chest on it; and then of a sudden he will get up and push it all away. If shut up, he will not remain a moment in repose, but turns up and down like a caged tiger. If at liberty, he will appear to be searching for some lost object, and will dig every hole and corner with great eagerness, but with no fixity of purpose. His brain appears to be beset by phantoms.

But, beside these general premonitory symptoms, there is one which the author considers infallible. Approaching madness impresses such a change upon the vocal organs of the dog, that his howl, once heard, can never again be mistaken. So important is this sign deemed by M. Sanson, that he has tried to give, by musical notes, some ideas of this "rabid howling," as he terms it, in its three principal varieties. He adds, that though this method may not entirely succeed in conveying the right idea, "the hearing of the sound in nature, though but a single time, produces an impression so distinct and so profound that no one can ever forget it." So it seems that the only virtue of "mad stones," &c., consists in keeping up the patient's courage.

IMPROVED BURGLAR ALARM.

In a recent conversation with one of the members of the New York police, we were told that the police records contain the names of between 8,000 and 10,000 thieves in this city. No dwelling can be long left unguarded without being broken into by some prowling ruffian, for the purpose of carrying off the valuables to be found in it. We can imagine a state of society in some distant future, in which the criminal class will be sifted out from the well meaning portion of the community, and compelled to earn their living themselves; but with the present absurd principles of criminal jurisprudence, and the still more absurd treatment of criminals after they are caught and convicted, the community has no resource but to fence out, by the best means in its power, this horde of depredators. All experience, as well as the confessions of criminals, has shown that locks which can be opened by keys on the outside are of little value, and that the best of all protections are dogs and lights. As many persons have objections to keeping dogs, and as the burning of lights constantly every night is expensive, it is desirable to accomplish the same object—of giving an alarm and of scaring away a burglar—by more convenient means.





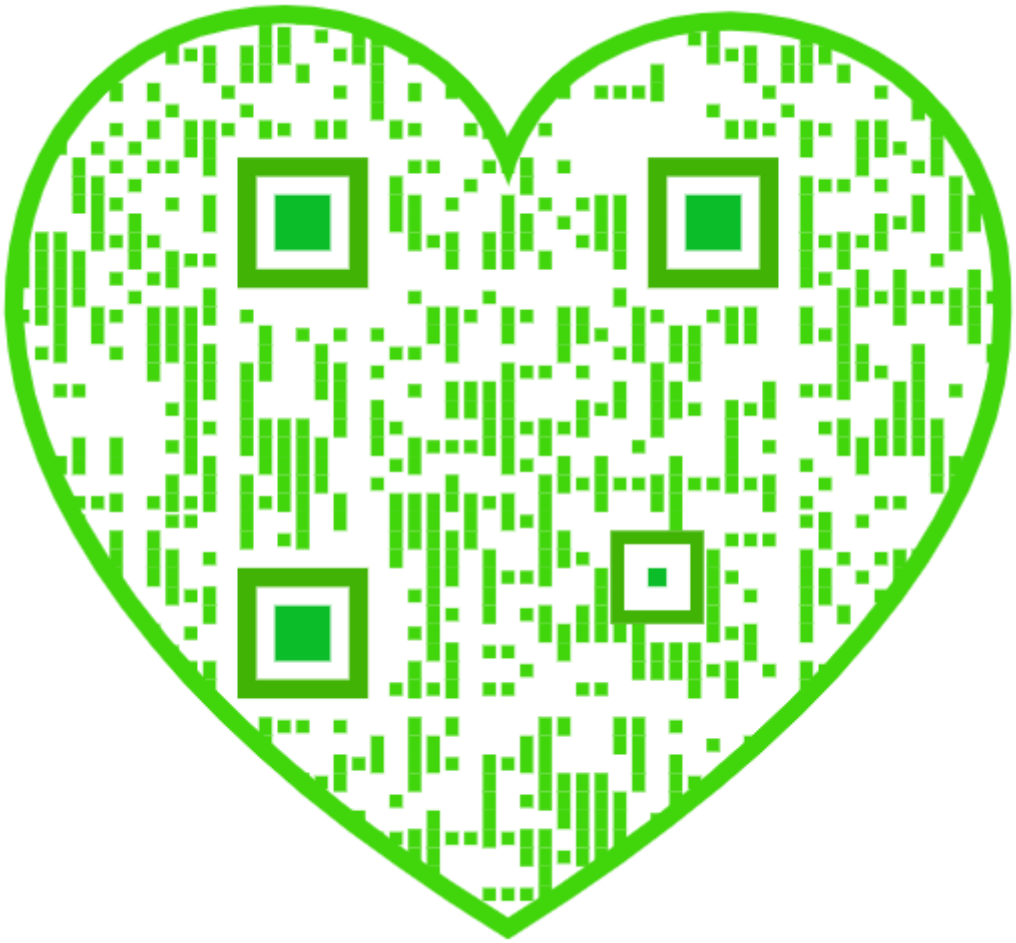
PROCTOR'S IMPROVED BURGLAR ALARM.

This is the object of the invention which we here illustrate. It consists of a clock and lamp so connected by a cord with the doors and windows, that the opening of either of these will light the lamp and cause the clock to ring an alarm on its bell.

In the cuts, Fig. 1 is a section of the lighting apparatus and clock, showing the alarm, match, &c., and Fig. 2 represents the connection of the door with the card by which the alarm is put in operation. A represents an ordinary clock, B the works or movements, and C the hammer of an ordinary clock alarum; the clutch or arm, D, of the hammer being restrained or held back, when not in use, by a lever, E, of the usual form, the upper end of which bears against the face of an eccentric or cam, *a*, attached to a movable dial or index plate, by setting which the crutch or arm, D, is liberated at the desired time, and the alarm sounded in consequence of the upper end of lever, E, falling into the recess in the eccentric or cam, *a*. These parts being of usual construction, do not require a minute description. The lever, E, however, instead of being permanently pivoted or attached to the case or frame of the clock movement, B, is pivoted to the lower end of a bent lever, F, which has its fulcrum at *b*. The upper and outer end of the lever, F, has two spiral springs, G H, attached to it; one spring being above and the other below the end of the lever, F. The lower end of the spring, G, is attached to the clock case, as shown at *c*, and the upper end of the spring, H, has a rod, *d*, attached to it, which rod passes up through the top of the clock case and has a cord, *e*, connected to it, said cord passing over a fixed pulley, *f*, attached to the door frame, I, and around a pulley, *g*, attached to a cord or chain, *h*, which may also be secured to the door frame, as shown at *i*. The end of the cord, *e*, is attached to a slide, J, at the under side of the upper part of the door frame, said slide having a pendent, *j*, attached which catches behind a projection, *k*, on the door, J', when the latter is closed.

On the top of the clock, A, is placed the automatic lamp-lighting device. K represents the friction plate, L the movable match holder, M the catch which is connected by a wire or rod, *l*, with a lever, *m*, within the clock case, and actuated at the proper time by a pin, *n*, on a wheel, *o*, so as to liberate the match holder, M. N is the rod which throws the extinguisher, *p*, off from the lamp tube, *g*, and O is the lamp.

The operation is as follows:—The alarm is wound up as usual, and the door, J', being closed, the slide, J, is



moved so that the pendent, *j*, will catch behind the projection, *k*. This movement of the slide, J, distends the spring, H, and causes the lever, E, to bear against a pin, *a'*, which projects from the frame of the movement, B, and also causes the lower end of the lever, E, to bear against the crutch or arm, D, and prevents the vibration

of the latter. When the lever, E, is in this position, the alarm and lamp-lighting device may operate in the usual way, for when the eccentric in the concave, *a*, arrives opposite the upper end of the lever, E, the lower part of said lever can be moved outward under the pressure of the arm, D, of the hammer, and the latter allowed to act upon the bell, A; the catch, M, being actuated at the same time so as to liberate the match holder, L, by means of the pin, *n*, on wheel, *o*, moving lever, *m*. Thus the lamp is lighted simultaneously with the sounding of the alarm. In case, however, a burglar attempts to force the door, J', and succeeds in so doing, the door in opening will liberate the slide, J, and the lever, E, will be moved by the springs, G H, so that its lower end will shove the lever, E, out from the hammer arm, D, and the hammer will be allowed to vibrate and produce the alarm.

In case the occupant of a room has occasion to go out, a cord, *a**, is attached to the slide by which the slide, J, may be retained to prevent the unnecessary sounding of the alarm. Thus it will be seen that, by a very simple arrangement, a time (or clock) and burglar alarm, and also a lamp-lighting device, are combined in one piece of mechanism; and, as the cord, *e*, would be burned in case of fire, the device also answers as a fire alarm, the effect being precisely the same as if the door were opened and the cord, *e*, liberated.

The patent for this invention was granted, through the Scientific American Patent Agency, August 7, 1860, and further information in relation to it may be obtained by addressing the inventor, G. H. Proctor, at Boverley, Mass.

AMERICAN NAVAL ARCHITECTURE.

THE STEAMER "TRUMPETER."

This steamer was constructed in New York, and has recently taken her appropriate position on the route of her intended service—Harlem River.

Her dimensions are as follows;—Length on deck, from fore-part of stem to after-part of stern-post, 125 feet 6 inches; breadth of beam at midship section, above the main wales (molded), 22 feet; depth of hold, 6 feet; draft of water at load line, 3 feet 9 inches; tunnage, 200 tuns.

Her hull is of white oak, chestnut, &c., which is very securely fastened with iron, treenails spikes, &c. Distance of frames apart at centers, 24 inches. The floors are molded 12 inches; sided 4 inches.

The *Trumpeter* is fitted with one vertical, beam, condensing engine; one cylinder, the diameter being 30 inches; length of stroke of piston, 7 feet; diameter of water wheels over boards, 18 feet 6 inches; material of same, wood.

She is also supplied with one return flue boiler, located in the hold; this boiler has no water bottom, and does not use blowers to furnaces: it possesses an ordinary steam chimney.

In addition to these features, the vessel is fitted with one independent steam fire and bilge pump and ordinary bilge injection. The boiler is thoroughly covered with felt, and is otherwise protected from communicating fire to the surrounding wood work; a pleasant and commodious saloon cabin is on the main deck. Bunkers for fuel are of wood. The hull of this steamer was built by Messrs. Webb & Bell, Williamsburg, L. I.; the machinery by the Fulton Iron Works, New York City.

It will be observed that the boiler of this vessel has no water bottom. In this connection we would remark that all boilers with internal furnaces, alike to the ordinary marine boilers, should have water bottoms, in order to guard fire from being communicated to their beds through openings therein, and when a natural draft is used for combustion, as in this case, the exhaustion within the furnaces, flues and pipe, is such as to cause a current of air to lead into and through any apertures opening to them, and hence fire or sparks are prevented from being emitted through any of the ordinary openings or joints about a boiler. But where blowers to the furnaces are used, the conditions are of an entirely different nature. The pressure of air within the furnaces, flues, &c., is so great, that fire, sparks, and even small pieces of coal in a state of ignition will be forced through any opening that may exist, and as it is impracticable to construct a boiler without a number of insecure openings, such as those of the furnaces, ash pits, joints, &c., fire is constantly being forced out through them, and a large number of steamers have been totally destroyed from this cause, added to which, the momentary firing of them from the same exposure is a matter of such frequent occurrence that if the traveling public were fully aware of the risk of life they incurred in patronizing steamers where blowers are used, the abandonment of all such vessels would be so universal that the proprietors of them would be compelled to remove the risk forthwith; their personal interest in this respect inducing their attention thereto more effectually than any legislative proceeding that might be enacted to reach them.

THE STEAMER "GUADALQUIVER."

This steamer is still another vessel erected by shipbuilders in this vicinity for private parties in foreign countries.

Such contracts as this are a source of much gratification to our citizens, inasmuch as it is a practical acknowledgment of the great success attained by American skill and American ingenuity in the science of naval architecture. The hull was built by Jacob Westervelt, foot of East Houston Street, New York City. Her dimensions are as follows:—Length on deck, from fore-part of stern to after-part of stern-post, above the spar-deck, 160 feet 6 inches; breadth of beam at midship section, above the main wales (molded), 23 feet 8 inches; depth of hold, 10 feet; depth of hold to spar-deck, 10 feet; her draft of water will be 6 feet, when fully equipped for service with her engines and coal; tunnage, 375 tuns.

Her framework is all of live oak, and square fastened in an extremely secure manner with copper, &c.; the outside planking consists of white oak and pine.

Her floors are molded 11 inches, and sided 5½ inches. Distance of frames apart at centers, 20 inches; frames are filled in solid.

The keelsons and ceiling are of yellow pine; the decks are of yellow pine, and the combings of mahogany; this vessel possesses two athwartship water-tight bulkheads, is well coppered, and schooner rigged; the ceiling and floors are edge bolted. This steamer is claimed to be of a beautiful model, with very sharp and easy lines that seem to ensure great speed; she is painted white, and at present draws 4 feet 8 inches of water. The machinery designed for the *Guadalquiver* will be made in Havana, where she will be taken immediately to receive it; of its description and dimensions we have no knowledge. The intended service of this vessel when completed, will be that of coasting around the island of Cuba; the owners are a firm in Havana.

DECOMPOSITION OF STEAM.—The *Scientific American* says that "if a block of iron, weighing 100 lbs., is raised to a white heat, and a continued stream of steam brought into contact with it, an increase of 30 lbs. will be made to its former weight. The heated metal decomposes the steam and absorbs about 30 per cent of its weight of oxygen." The matter may be of no great consequence, but no such result will follow. As soon as the surface of the iron block has become completely oxidised no further decomposition of steam would occur.

[We find the above paragraph in the *Engineer*, edited by our old friend, Zerah Colburn, who, in all his wanderings round this world of care, has finally fetched up at home in connection with the above somewhat diminutive yet unpretending sheet. Mr. Colburn, like all the rest of us, has had some bitter and some sweet experience as a journalist, and on some topics wields the pen of a ready writer. At one time he edited the *Railroad Record*, published in this city, which subsided into the *American Engineer*, which he also edited with considerable ability, but it also subsided. Whether smarting under disappointment or not we cannot say; but certain it is that he left his native country and went to England, where his talents soon attracted the attention of Mr. Wheaton, proprietor of the *Engineer*, a journal of solid character, published in London. Mr. Colburn was for some time connected with that journal, and we were astonished, one day, to receive a modest note from him, written from the goodly city of Philadelphia, soliciting an exchange with the SCIENTIFIC AMERICAN, to which we most cheerfully responded. We confess, however, that we are surprised at this, to us, sudden change in the status of our editorial friend. We welcome him, however, to all the privileges and responsibilities of the fraternity, and will be happy to show him all the courtesies to which he is entitled, claiming, however, nothing in return. For some cause the SCIENTIFIC AMERICAN has ever been a thorn in Mr. Colburn's flesh. In the above paragraph, the editor informs his readers that the matter in reference to the decomposition of steam may be of no consequence, but that no such result as we specify will follow. Here is a flat denial of our statement; this, however, is of no great consequence, but if he will permit us, we will state that we probably understand this matter as well as he does, and we repeat that such a result as we describe will follow. As soon as the surface of the iron block has become completely oxydized, the oxyd being in a very porous state will permit the steam to come in contact with fresh iron, and further decomposition of steam will occur.—EDS.

THE SEWING MACHINE.—NO. I.

It is not more than seven years since this new industrial agent began to be introduced into general use, and yet if its history down to 1860 should be written, the magnitude and wide-spreading influence of its operations would give the narrative the style of romance. Many causes conspired together in preventing its early adoption by manufacturers, for whose work it was more especially adapted. Among these were—

1. The objection which meets every new invention on the start, "that it is an experiment which, if it fails, will cost us money."

2. Its introduction into a shop or factory would involve changes in the business, and new methods and new plans, and most people prefer to pursue the methods to which they are accustomed, and which are therefore easy.

3. After the "boss" or manufacturer is convinced that the invention will promote his business, he has yet to bring his operatives to the side of the new-comer, and get them interested enough to give it a fair trial. This is oftentimes difficult to do where the old prejudice exists that a labor-saving machine is an enemy to the poor.

4. The common sewing thread which had been good enough for seamstress and tailor at the rate of 50 to 60 stitches a minute, was found to be too imperfect and uneven for the rate of 250 stitches a minute—we might say, for the rate of 2,500 stitches a minute, since good sewing has been done at that speed.

It took years to overcome these objections, and before the last one could be surmounted, improvements and inventions had to be made in the art of manufacturing thread—especially silk thread, which was rarely of uniform size in the same skein, and so was unfit for machine sewing, whilst it was an essential article in many kinds of work. But the new demand called forth the requisite skill and invention, and now American "machine twist" rules the market and supplants the foreign article, both in the factory and the household. The production is about $1,000,000 a year, and the increased sales of spool-cotton since machine-sewing was introduced amount to more than $1,500,000.

Another branch of business which has been created is the manufacture of sewing machine needles, which is said to employ about 1,000 men, and the profits on which are put at the high rate of $6,000 per week. One dozen needles last about a week. All sewing machines are now japanned, and many of them are tastefully ornamented with inlaid pearl. In 1850 there were only two japanners in this city, but now we have several large establishments.

Along side of these facts we must place the business of the construction of the machines. The men employed are about 5,000 in number. The capital invested cannot be less than $3,000,000, and some of the companies divide 100 per cent. or thereabouts. The Wheeler & Wilson factory, at Bridgeport, Conn., rivals the U. S. Patent Office in dimensions, and it has a capacity for turning out 150 machines a day. When we assert that more than 200,000 sewing machines, of one kind with another, have been sold in this country, and 20,000 more exported, our readers will begin to be prepared for the statistics of some of its productions which we propose to collect hereafter. Many of these are known as single-thread machines, but the greater part sew with two threads. The single-thread machine makes the chain-stitch, and it is popular because of the low price at which it is afforded, and because the stitch is such as will unravel without having painfully to cut every other one, as in the two-thread machines. This is a desirable quality where in a family of children frequent alterations of clothing are required, such as letting out and taking in a tuck, etc. Clark's machine, manufactured at Bridgeport, Robertson's, Watson's and Gibbs', are of this character. The shuttle machine makes the interlocked stitch—one thread, at each completed movement of the needle, having been passed around the other. Singer, Ladd & Webster, Sloat, Wheeler & Wilson, Finkle & Lyon, and many other manufacturers produce machines of this class. The double-chain stitch is made with two threads, and the chief representative of this class is the Grover & Baker machine. This machine is preferred by the glove manufacturers, as the stitch is of an ornamental character, as well as exceedingly strong.

THE ORIGIN OF THE ROCK OILS.

MESSRS. EDITORS:—I propose to promulgate through the columns of your journal, a new theory regarding the origin of the oil known as petroleum or seneca oil, which is now attracting so much of the attention of the public.

I do not mean by "new theory," that the view I take of its originating from coal is new, but I shall attempt to detail the process by which it has been gathered in its present beds, and give facts and reasons, which to me, are ample for a reliable faith in the theory I now propose.

The close analogy in the character of the petrolium and coal oils, whether traced in the odor, the color, the benzole, naphtha, burning spirit, the unctuous lubricating grease, or the paraffine, give unmistakable evidence of all being derived from the same source. No such analogy can be found in any class of animal or insect oils or grease. My conclusion then is, and it corresponds in this respect with a majority of those who are most competent judges, that these oils are derived from coals, and with the coals originally from vast vegetable deposits. Long experience in the manufacture of oils from coal, and close observation of the various products eliminated in the destructive distillation of cannel coal, embolden me to say, that, cannel, bituminous and anthracite coals were originally deposits of masses of vegetable matter of nearly the same general constituent properties, and that the main difference which we now observe and which gives them distinctive names, has been caused by heat of greater or less intensity, which during former ages of the earth's history has been communicated to those deposits.

I shall have no difficulty in making myself understood by those accustomed to the process of obtaining oil from coal. To others the mysteries of which I speak, may remain mysteries.

When we apply heat to a retort filled with a good quality of cannel coal, we derive from the coal in the form of vapor, the various properties before named, and which by arranging our condensers so as to gather the products at points when the temperature subsides from 800° in the retorts, to 500°, 400°, 300°, 200°, 100°, and 30° respectively, we get at the first opening represented by 500° a thick paraffine oil, destitute of all spirit or property suitable for the burning oils so much sought for in the market, and marking a specific gravity of about 932 or 20° on the ether test. At the next opening representing 400° we get an oil mixed in a small part with spirit or burning oil, but in the main a heavy grease with a small portion of paraffine of the specific gravity of 900 or 25½° of the ether test. At the next opening 300° we get a product nearly all burning spirit, and of a specific gravity of 851, or 35° of the ether test, at 200°, or the next opening, the product will have a gravity of about 800, or 45 by the ether test, at a temperature of 100°, or the next opening, the product will represent a gravity of abont 735, or 60° on the ether scale, and at 30° of temperature the product will be very light naphtha of the specific gravity of 700, or 70° and even 80° and 90° on the ether scale.

This is about the range when sufficient heat is used to drive over the volatile matter in reasonable time for practical work, but if instead, a very low and slow heat be applied, very little but the light products will be driven over, and the paraffine, oil and grease will be left in the coke, which when burned will give considerable smoke and flame, while in the first case the smoke and flame will scarcely appear during combustion.

I suppose then, that the heat on our eastern slope, in the vicinity of our anthracite coal fields has been great, and that all the volatile matter has been driven off and for a time held in the form of vapor in the heated air above, while on the western slope, or the great bituminous coal basin, the heat has been less, but great enough to drive off the more volatile portion from these coals, which, like the first, was also for a time suspended in vapor above the earth, while the cannel beds which are the most elevated and most northerly of the coal beds, were not so much heated as to change materially their constituent properties.

The new theory then is, that the vapors thus raised would move by force of currents till some point was reached that was cool enough to promote condensation, and that which would first condense would be the heavy paraffine oil, which might fall in the form of pitch as at Trinidad, while the lighter might still be moved to other points till all except the most volatile would be converted and deposited, and it might be many years before those same districts were cool enough to permit the condensation of water, and allowing ample time for deposits of earth, and the chemical combinations that have covered and continue to protect those oil deposits from being displaced and driven off by the waters.

I am confirmed in these views and opinions by the great range in the specific gravities and of course in the qualities of the oils in different localities, varying ten to fifteen degrees in 25 miles, while in some distant localities the change is fully 25° by the hydrometer, showing in a manner conclusive to me that the deposits are from condensation, and not a distinct natural product as claimed by some, or the results of deposits from coral or other insect as claimed by others.

I am aware that I have opened a door for strong criticism, but if those who adopt other views will stick close to known facts for the basis of their theory, I shall be glad to meet such criticism. It is a field of great magnitude, while the vast quantities known to exist, puts a damper on the hopes and prospects of those of us who have spent so much energy, labor and money in preparations and the manufacture and introduction of coal oil. This happy discovery will give light to millions on millions of eyes, and it will give millions on millions of dollars to commerce.

Of its excellent character as a burning oil, and as a lubricator as compared with the best qualities of kerosene and other coal oils, of the number of wells, the average and aggregate quantity taken per day or month, of the probable durability of the fountain, as well as the qualities in different localities, I will write you for a different number, as a constant familiarity of several months, both in exploring the ground and analizing the oils will enable me to write a truthful history.

JOSEPH E. HOLMES.

Meadville, Pa., Sept. 15, 1860.

THE CRANK—A QUESTION ANSWERED.

MESSRS. EDITORS:—With your permission I will endeavor to answer the question of "a mechanic" in your number of August 11th, and I trust that a few words will make the matter somewhat plainer than the figure alone can.

The figure shows, and Professor Byrne proves the very point, which "a mechanic" not merely admits, but which forms the very ground of his question: viz. that the crank moves through a larger arc while the crosshead passes over the outer half, than while it passes over the inner half of the slides. "A mechanic" does not want the point proved, but wants to know the mechanical reason why?

There is, however an error implied in the form of this question, viz., "What does the irregular motion of the crank consist in?" The irregularity is not in the motion of the crank, but in that of the crosshead. That is to say, the movement of the crosshead over the outer half of the slide, is slower than its movement over the inner half, and, therefore, the crank (moving uniformly) passes over a longer arc in the first case than in the last.

The reason why this uniform motion of the crank produces an unequal motion of the crosshead is shown as follows:—Let the movement of the crank be resolved into two movements, one parallel to the slides, and the other perpendicular to them. That component of the motion which is parallel to the slides, will have the same effect on the movement of the crosshead, when the crank is at G moving outward, as when N is at F moving inward. But the other component, viz., that by which the crank leaves the line, G and F will act very differently on the crosshead in the two cases. In the first it draws the crosshead forward from A to C, and in the other, it retards the movement of the crosshead from B to C. So that in the first case both components of the crank movement act in the same direction on the crosshead, and its motion is that due to their sum; and in the latter case they act in different directions, and its motion is that due to their difference. Consequently, the crosshead when on that half of the slide next the cylinder moves with greater speed than when on the other half, the motion of the crank being uniform.

Q. E. D.

Mount Vernon, Ohio, Sept. 15, 1860.

FRESH-WATER SPONGES.

Sponges have long been ranked among the most singular of all aquatic productions, and it is still a question whether they shall be classed in the animal or vegetable kingdom. Linnæus was disposed to place them among the latter, as aquatic algæ; Count Marsili, although of a similar opinion, admits the existence of a certain motion of systole and diastole, like the contraction of the heart, in sponges—a fact in favor of their animal nature. Later investigations confirm this conclusion, and sea sponges are now considered in the light of polypis, like corals, madrepores, etc. M. Lecog has lately made two curious communications to the French Academy on this subject. While boating on the waters of one of the interior lakes of France, he observed certain whitish lines on the surface of the water. On examining them he found that they were trunks of trees or logs floating, and covered with a quantity of *spongillae* or *ephidatiae*, the name given by Lamoroux to the fresh-water sponges. They formed a crust of more than five centimeters, and branched out at intervals like sea-sponges, the whole mass being covered with a slimy substance. Since the sponge is glued to the log by this substance, which is the first to appear, it is supposed that it gives birth to the spongilla. When the sponge is dried up, this slimy substance changes into a thin, transparent membrane, which shines like the track of a snail. Examined with the microscope, numerous grains are discovered, with here and there speculæ of a gelatinous nature, bearing small knots, which M. Locog considers to be germs of the succeeding generation. The manner in which the sea-sponge is propagated is well known: it produces certain grains which are called eggs by those who believe in its animal origin, and seeds by those who think it a vegetable. The spongilla is reproduced in various ways: First by the extension of the slime in which the speculæ are found—in this manner it may spread over a large surface. Second, in its adult state, masses of speculæ are formed carrying a large number of little round globules, which certainly propagate the species, but which, according to M. Lecog, partake more of the seed in cryptogamous plants than of that of eggs. He states further, that he has never found in spongilla of this age the ciliated embryos which, according to Laurent, swim in the water for five or six days. The egg-like grains he has obtained in autumn do no not separate from their parent unless the latter be in a state of decomposition, or exposed to the voracity of certain infusoria. The spongilla are grouped together in great numbers, and so closely, that it is extremely difficult to separate one individual from another. Examined through the microscope, each spongilla displays a vast population of infusoria feeding on slimy matter, and living in complete security.

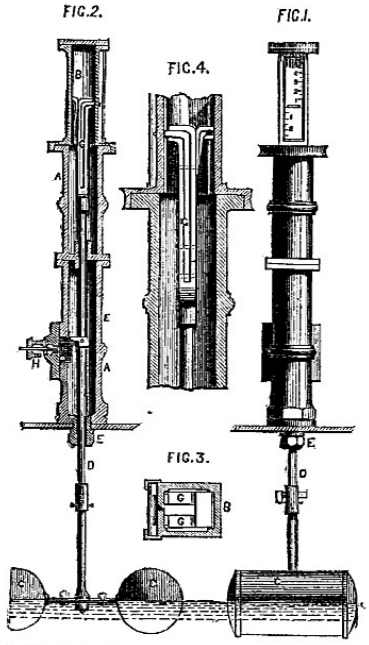
PINEL'S MAGNETIC WATER GAGE.

BY GEORGE PIGGOTT, BIRMINGHAM, ENGLAND.

Most appliances for indicating the hight of water in steam boilers are liable to be inefficient for the purpose, chiefly from undue friction caused by the buoy rod passing through a stuffing-box or packed joint; the packing is often so tight that the float will not move the rod; and if it is packed lightly to dispense with the friction, then there is a leakage of steam, which is very objectionable. The Magnetic Water Gage described in the present paper, the invention of M. Pinel, of Rouen, France, is free from these objections; the chief points to be noticed are, its compactness and simplicity, and the facility of fixing, its exactness in working, and durability, and the very little attention required to keep it in order.

The gage is shown in Figs. 1, 2, and 3, and consists of an upright cast-iron pipe, A, on the top of which is fixed a brass box, B, square in section, as shown in the plan, Fig. 3. A hollow cylindrical float, C, proved to stand a pressure of ten atmospheres is attached to an iron rod, D, passing through the bush, E, without any packing, and also through the guide, F, perfectly easy and free. To the upper end or this rod is fixed a strong horse-shoe magnet, G, shown enlarged in Figs. 4 and 5, the poles being bent forwards at right angles to the body of the magnet, which falls or rises in the brass box, B, with the fall or rise in the boiler. On the exterior face of the box is an isolated iron needle, held merely by the attraction of the poles of the magnet, which it follows in all its movements, rolling on the face of the box as the magnet rises or falls according to the hight of water in the boiler. The face of the box is silvered and graduated, so that the least movement of the needle is perceptible; it is covered with glass to protect it from dust and injury. On the side of the upright pipe, A, a shrill whistle, H, is fixed, closed by a valve kept shut by the internal pressure of steam; when the float is nearly at the lowest limit of its range, a small stud, I, on the rod, D, presses on a lever, which immediately opens the valve, and allows the steam to sound the whistle; this at once makes known the want of water.

The fixing of the gage is exceedingly simple, and does not allow any leakage of steam, which is not only a waste, but often injures the plates of a boiler. A hole about $1\frac{1}{4}$ inch diameter is drilled in the top of the boiler at the required place, and the gage is fixed upright, the joint being made with india-rubber and a nut screwed



on inside the boiler. The length of the buoy rod is adjusted to suit the hight of water it is usual to work at, the float being weighted to sink just half way in the water, so that the adjustment is reduced to a mere matter of measurement; the needle points to zero when the water is at its proper working hight, and the water level may then be lowered $2\frac{1}{2}$ inches before the whistle sounds; but if it exceeds this limit by $\frac{1}{8}$ inch, the whistle will sound the alarm, and will continue to whistle till the water level is raised again. The gage is sometimes constructed with two whistles, for high and low water. The buoy rod is limited in its motion both upwards and downwards; when the water is raised six inches above the proper working hight, the coupling of the buoy rod comes in contact with the bush, E, which prevents the magnet from being forced against the top of the gage; and when the water falls more than three inches below its proper level, the brass coupling which joins the magnet to the buoy rod rests on the top of the guide, F, holding the buoy suspended till the water is raised high enough to float it again; this prevents the magnet from moving out of the brass box. Neither of these cases ought to occur, but the provision is made in case of their occurrence. The brass box is planed on the back and front, and for a portion of the width on each side, forming a guide for the magnet to slide in. On the back of the magnet is fixed a brass bar, bearing only on the planed surface on each side of the box, by which the magnet is made to slide perpendicularly; immediately under this bar a light spring is fixed to the back of the magnet, also bearing only on the back of the box, which keeps the poles of the magnet slightly pressing against the face.

The water gage indicates the hight of water so exactly, and the absence of friction renders it so sensitive, that the writer has noticed, when it has been put just over the fireplace of a double flue boiler with brisk fires going, that the needle rises and falls with the fluctuation of the water caused by the quick ebullition. The gage requires scarcely any attention and the inconvenience of constantly greasing and watching that the float acts is entirely done away with. The silvered face is kept clean by washing with soap and water two or three times a year; this is all the attention it requires.

The total number of these gages now at work is 3,500, sixty-five of which are in England and the remainder principally in France; all of which are working with as much accuracy as when first put up, and some of them have now been nine years at work. The rubbing of the magnet against the brass box gives it a polish that renders the wear inappreciable; its magnetic power must necessarily be weakened in time from the effects of rust, and it would then require renewal, but at present its durability has not been impaired in any way. As there is no passage of steam through the gage, the interior is not liable to any incrustation of deposit. Magnetic gages were put up at the Paris mint in 1855, and have never been touched since that time; they have also been adopted extensively in the French government workshops and in manufactories.

After the reading of the paper, a discussion took place, in the course of which Mr. W. Richardson said he had used a different construction of magnetic water gage on a boiler working up to 50 pounds pressure situated in a forge, where he was afraid of a glass gage being exposed to injury, and wanted a gage that would not be too high up to be easily seen. It consisted of a copper float about seven inches diameter fixed on a lever, the horizontal spindle of which passed freely through the front of the boiler into the casing of the gage without any stuffing-box or packing and carried at its outer extremity a bar magnet fixed at right angles to the spindle and parallel to the float lever, working within the casing of the gage; outside the casing was a steel indicating finger, working loosely on a pin in the same center line as the spindle of the magnet, which showed the hight of water on a dial plate. The magnet and indicating fingor both rotated on the center point of their length, so that both were completely balanced, and the finger was propelled by each end of the magnet. This gage has now been at work for eighteen months, and continued perfeetly correct; when first put np, immediately over the fire, its sensitiveness was so great from the violent ebullition that the index was very unsteady, and in order to keep the surface of the water quiet, a piece of sheet iron had to be fixed horizontally, inside the boiler, sufficiently below the surface of the water not to interfere with the range of the float.

Mr. C. W. Siemens had seen a magnetic water gage brought over from America about fifteen years ago, similar to the gage just referred to, having a radial needle worked by a magnet attached to the float, but had not seen it put into operation.

A THRILLING NARRATIVE OF THE ESCAPE OF THE STEAMER "ARABIA."

We find in the Springfield *Republican*, the following thrilling account of the escape of the *Arabia* from sudden and terrible wreck on Fasnet Rock.

{Steamship *Arabia*, 11 A.M.,
{ Friday, Aug. 3, 1860.

In the midst of life we are in death. Just half an hour ago, while standing on the bows, the ship running 14 knots an hour under steam and sails, in a thick fog, I heard a loud shout "land ahead!" I turned toward the captain, or rather had my eye on him at that moment. His face could not have expressed more horror if he had seen hell's gates opened. He sprung to the engine bell, at the same time shouting "hard a-port your helm." A counter order of "starboard" was given. The captain leaped from his footing, shouting so that his voice was heard above the escaping steam, "hard a-port in God's name." His order was obeyed. Then turning forward among a hubbub of voices, shouting "we are lost," "God have mercy on us," &c., &c., I saw the rocks from the ship's bows. On their top was a lighthouse. As we swung around, it seemed as if we should every moment feel the shock of striking. The huge swell of the Atlantic was reverberating and the spray flying all around us. The sails took aback, heeling us over so that the deck stood up like the roof of a house. Women were screaming, seamen running

to and fro, and above all the captain and lieutenants shouting so as to be heard above the shrill escaping steam "hard a-port, hard, hard!" "Brace around the foreyard!" "Let fly the halyards and sheer fore-and-aft!" I stepped abaft the foremast to be out of the way of its fall and waited for the shock. But

"There is a sweet little cherub who sits up aloft
And looks after the life of poor Jack."

We approached as all agree within ten feet of the rock, and then began to recede. Just realize that there was only ten feet between us and eternity. It is the opinion of sea-faring men on board, that the ship if she had struck, would have sunk in five minutes, for it is a sharp ledge of rocks, six or seven miles from any shore, and deep water all around. The boats could not have been got ready, and if they could, they never could have lived in the heavy surf. No—if she had gone ten feet farther we should have been almost instantly precipitated into a raging sea, where six or seven miles from land, in a dense fog, few of us would have escaped. We should have all perished as miserably as did those in the *Hungarian*. Three seconds more would have tolled the death-knell of most, if not all of us, for we were so enveloped in fog, and far from land, and also no boat at the lighthouse, that if we had seized fragments of the wreck they would have been torn from our grasp by the sea boiling as in a cauldron over the sunken reefs, hours before our fate could have been known. I knew there was no time to run below for life-preservers —which are hung up by each berth—and so centented myself with just stringing up my nerves for a buffet with the waves. For three minutes, I can assure you, man showed what he is when expecting the "King of Terrors." Two or three ladies took it heroically and seemed to draw in strength from the scene around them. It was a terrible moment for the captain—Captain Stone of the Royal Navy—for as we swung around, the sails taken aback and heeling us over, everybody expected to feel the grinding crash beneath their feet. I felt for him, for all his great rashness, and gladly say that to his decision inour hour of need we owe our lives. The rock is called Fasnet Rock, and upon it is the Cape Clear lighthouse. A subscription is now being taken up among the passengers for the seaman who first shouted "breakers ahead." I shall never forget to my dying day the face of the captain when he heard that wild shout. I have seen distress and pain in all their forms, but never a face like that, so full of horror perfect agony, and crushing responsibility. The cry "breakers ahead," the stopping of the engines, the escape of the steam, and the shifting of the helm, all occured in one second. It seemed at the instant as if it was utterly impossible to stop the ship's way in time to save us; but God rules. He put forth His hand, and the vessel, trembling as if with mortal fear, yielded to her powerful engines, receded from the rock, and we were saved.

ROTARY DYNAMOMETER.

[Translated from Armengaud's Genie Industriel.]

The construction of this dynamometer is based on the property of gear-wheels with oblique or helical teeth, to exert a lateral pressure which is in direct proportion to the power transmitted by the wheels and to the inclination of their teeth.

This dynamometer is represented in the accompanying engraving, where Fig. 1 represents a side elevation and Fig. 2 is a plan or top view, and it consists of two parallel shafts, which have their bearings in four boxes that are firmly secured to a suitable bed or frame.

Each of these shafts bears a cog-wheel with oblique teeth and a pulley for receiving or transmitting the action of a belt. The pulleys and the wheels are firmly keyed to the shafts, and they are precisely of equal diameters, so that they rotate with equal velocities.

The shaft of the wheel, A, rotates perfectly free in its journals, and it is prevented from moving in a longitudinal direction by two projections, which confine the ends of the shaft.

The wheel, B, on the other hand is mounted on a shaft with long cylindrical journals, and the wheel, A, is considerably wider than the wheel, B, so that the latter can assume a motion in a longitudinal direction of the shaft without being thrown out of gear with the wheel, A.

The end of the shaft, B, is provided with a steel point, which presses against the plate, F, that is made of one or more leaves of spring steel, according to the power which it has to sustain. The ends of the plate, F, are connected to the frame, E, by means of links, G, which form the support for said plates.

The small rod, K, one end of which is connected with the plate, F, at about the middle of its length, is attached with its other end to the index, I, and causes the same to sweep over the sector, H, which is provided with a scale, and which is secured to the frame, E, in such a manner that it can easily be observed while the device is in motion.

The rod, K, is provided with a right and left hand screw, so that its length can be adjusted, and that the index can be set to the starting point on the scale.

In order to use this device for the purpose of measuring the power required by some working machine, it is fastened down to the floor in such a position that the

Fig. 1

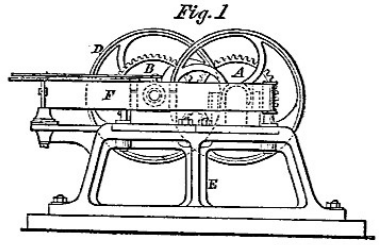
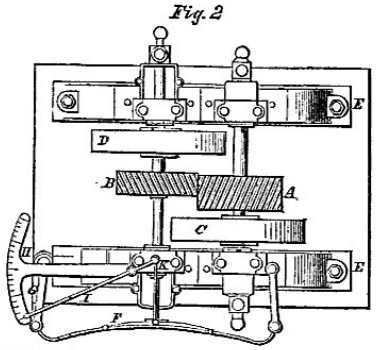


Fig. 2



belt from the driving pulley of said working machine can be brought on the pulley, D, of the dynamometer. Another belt from the pulley, C, transmits the power to the spindle of the working machine under observation.

As soon as the motion of the spindle of the working machine meets with a resistance, the index, I, will be seen to move on the sector, H, and if the resistance to be overcome by the working machine is pretty uniform, the index will maintain its position with slight oscillations.

The point indicated by the index on the scale, H, is noted, and the number of revolutions of the pulley, C, per minute are counted, and by multiplying the two figures thus obtained, the number of foot-pounds per minute required to drive the working machine in question is found.

The scale on the sector, H, is obtained by actual experiment. A brake is applied to the pulley, C, while motion is imparted to the pulley, P, and the power exerted by an arm of known length which extends from the brake, and which connects with a spring balance, is noted. The force consumed is equal to the sustained weight multiplied into the space traveled over by the surface to which the brake is applied, and it will be easily understood how the device above described furnishes the elements necessary to determine the power required to drive a certain working machine.

The weight to be applied to the spring plate, F, for the purpose of indicating one foot-pound per second, can be determined by calculation.

If the angle, a, indicates the inclination of the cogs towards the axle of the wheel, the power, Q, applied to the circumference is decomposed into two components—one, R, perpendicular to the direction of the axle and one, P, parallel to the axle of the wheel, and the component, P, is equal to Q x sin. a.

The spring plate, F, the reaction of which balances the component, P, is bent in the form of a parabola, so as to increase the sensibility of the device and to obtain a scale with equal graduations for equal powers. Consequently, if

P, the weight applied to the circumference of the pulley, B = 1 lb.

a, the angle of the cogs with the direction of the axle = 22° 30′.

R, the radius of the pulley, C.

R′, the radius of the pitch circle of the cog-wheels, A B.

P′, the effect exerted on the spring plate by the end of the axle of the wheel, B; and it is found

$$P' = P \times \sin a \times \frac{R}{R'}$$

$$= 1 \times \frac{0.38268 \times 0.245}{0.153} = 0.613 \text{ lbs.}$$

The number 0·613 expresses the effect exerted on the spring plate by applying one pound to the circumference of the pulley, B, and it is only necessary, therefore, to apply multiples of this number to the spring plate in order to find the effect of two, three or more pounds applied to the circumference of the pulley.

In order to obtain, in foot-pounds per second, the effect measured by this device, it is necessary to count the number of revolutions of the pulley per minute, multiply this number with the number given by the index and divide by 60.

For instance, if the index shows 15 lbs. and the number of revolutions is 70, the result will be

$$\frac{70 \times 15}{60} = 17.50 \text{ foot-pounds per second.}$$

In order to be able to find the result without a calculation, a table has been prepared, giving the effect in foot-pounds per seconds or the effect of from 5 to 75 lbs., as indicated by the index, and for velocities of from 10 to 100 revolutions per minute:—

Revolutions per minute.

Foot-pounds per second.

Indications of the scale.	10	20	30	40	50	60	70	80	90	100
5	0.83	1.67	2.50	3.33	4.17	5.00	5.83	6.67	7.50	8.33
10	1.67	3.33	5.00	6.67	8.33	10.00	11.67	13.33	15.00	16.67
15	2.50	5.00	7.50	10.00	12.50	15.00	17.50	20.00	22.50	25.00
20	3.33	6.67	10.00	13.33	16.67	20.00	23.33	26.67	30.00	33.33
25	4.17	8.33	12.50	16.67	20.83	25.00	29.16	33.33	37.50	41.67
30	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00
35	5.83	11.67	17.50	23.33	29.17	35.00	40.83	46.67	52.50	58.33
40	6.67	13.33	20.00	26.67	33.33	40.00	46.67	53.33	60.00	66.67
45	7.50	15.00	22.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00
50	8.33	16.67	25.00	33.33	41.67	50.00	58.33	66.67	75.00	83.33
55	9.17	18.33	27.50	36.67	45.83	55.00	61.16	73.33	82.50	91.67
60	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00
65	10.83	21.67	32.50	43.33	54.17	65.00	75.83	86.67	97.50	108.33
70	11.67	23.33	35.00	46.67	58.33	70.00	81.67	93.33	105.00	116.67
75	12.50	25.00	37.50	50.00	62.50	75.00	87.50	100.00	113.50	125.00

The advantages of this device are, that it is extremely simple in its construction; that it indicates the effect on a scale which is not affected by the motion of the machine, and which allows of observing the index with the greatest convenience; and that it indicates pretty large effects without requiring a very strong spring, and that the resistance of the spring can be regulated by using gear-wheels with cogs of more or less inclination.

IMPROVEMENTS IN THE COTTON PLANT.

MESSRS. EDITORS:—I have, for over two years, endeavored to graft or bud the *Asclepias Syrica* (or silk weed) on to the *Gossypium* (or cotton plant), but have failed in my efforts, which I attribute to a want of experience.

Should any of your numerous readers be able to inform me of the best time and manner to operate on those plants, I should feel obliged, as I am now located in a cotton growing country, and am anxious to solve the problem as to whether it is possible to grow cotton in other than Southern States. My theory is, that it can be done by raising a hybrid which will combine the qualities of the silky down of the silk weed—which grows in every State—with that of the cotton plant. If it is possible to do this, no estimate could be formed of the benefits which would accrue to the United States, commercially and politically.

The *Asclepias Syrica* differs from other species of *Asclepias*, in having large purple flowers, sharp thorns, and pods which contain a large quantity of silky-like thread, and has often been used in filling beds and pillows. In cultivating and drying these, I have succeeded in obtaining a fine, strong silk, weighing 3 oz. to the stalk. I intend, next Spring, to plant Western silk-weed *seed* with cotton *seed*, and anticipate getting a hybrid seed from them. What say your horticultural readers? Shall I succeed or not?

ALBANY PECKHAM, D.D.S.

Whitesville, Ga., Sept. 1, 1860.

THE POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

[Reported expressly for the Scientific American.]

The first meeting of this association after its summer vacation, was held on Thursday evening, 13th inst., Professor C. Mason presiding.

The Great Eastern.—Lieut. Bartlett, chairman of the committee to visit the *Great Eastern*, being called on for his report, stated, that immediately on the arrival of the *Great Eastern*, he addressed the consignees, Grinell, Minturn & Co., advising them of the appointment and object of the committee. He received a prompt reply to the effect that the letter would be laid before the directors. But after waiting a considerable time for action from the directors, he wrote another letter, and to this letter no reply was received. Under these circumstances it was concluded that the committee had nothing to do.

Mr. Dibben was one of the committee, but visited the ship on his own account. He found it very difficult to procure information. The officers of the ship seemed to be unwilling or unable to answer questions which were pertinent to the practical working of the ship, such as, what was the displacement, midship section, lines of the ship, &c.? I was told by the engineer, that the average consumption of coal was 3 17-100ths lbs. of coal per horse power per hour. I examined the log of the ship, but it was incomplete. One card only could be found for the whole trip. On our ships it is the custom to take a card at least every day and enter it on the log. The facilities for turning the ship are admirable, and it is certain that the wheel and screw work well together. The method of bringing the force of the two engines on one wheel, and the automatic lubricator I consider very admirable.

Mr. Fisher—It is generally believed that the *Great Eastern* is a commercial failure, but at the same time, it is conceded that there is great economy in large vessels when they can be freighted, and it might be an important point for us to determine what are the limits of size.

The President considered the subject would involve matters, which, the club as a scientific society, could not entertain.

Lieut. Bartlett—There has been a great demand during the last fifteen years for large ships and fast sailers; but there is coming now a reaction. How much a ship will carry is generally of more account than how fast she will sail; one is at the expense of the other. Half clippers are now sought for more than any other kind of vessel. The present condition of commerce has no need of vessels like the *Great Eastern*. Her owners will do well to dispose of her to the English government. But the government may find that they have bought an elephant. It is not often that such a ship could be used, and there would be hesitation in risking the whole success of an important expedition on a single trust. Her tunnage divided in five vessels would be more useful. I. one end of the *Great Eastern* is aground, the whole ship is stranded. A fire, explosion, or contagion is dangerous to every soul on board.

The President—The owner of the *Thomas Powell* offers $5,000 above its cost of construction, for any vessel which will make the trip to Newburgh in 15 minutes less time than his own boat. The offer is seriously made, and I am satisfied that if it is fully met the money will be well invested.

The Lady Elgin Disaster.—Lieut. Bartlett—By the collision of the *Lady Elgin* with the schooner *Augusta*, on Lake Michigan, on the 8th inst., 300 lives were lost, and all for the want of a little light. The case is clear, and we are constantly running such risks, yet there is no law which covers the whole ground. A few years ago, in France, in view of such dangers, a commission was appointed to examine the whole subject of beacon and signal lights for mariners. The result of this bringing together the views of scientific and practical men was a system so perfect that it was at once adopted by the chief governments of Europe, and is unchanged to this day. One of the improvements then adopted was the Fresnel light. The Fresnel light was proposed for use on our coast, and the opposition was violent, certificates and memorials came from every quarter to the effect that the old lights were good enough. But now petitions came from the owners of vessels sailing to California, for a change of the lights on Craney Island, for the lights on fishing boats being the same size misled them. These facts made their impression on the Secretary of the Navy, and the Fresnel light was adopted and now there are 500 along our coast. In the French system the kind, color, position and intensity for lights on all kinds of vessels is prescribed. It should be so here. People seem to think that vessels should have lights proportioned to their size, that a small vessel needs only a small light, but if there is to be a variation of intensity it should be the other way, and the smaller vessels be required to carry the brightest light. The danger is to the larger, and the warning light must be distinctly seen to be avoided. A small vessel as in the case of the *Arctic* and of the *Lady Elgin* strikes low and the damage may be beyond the reach of the carpenters. Men on the schooner saw the lights on the *Lady Elgin* 20 minutes before the collision. I feel and appreciate such danger as a seaman; I have often been in peril from those little vessels unlighted. A lantern which may be purchased for $10 or $15 will give a light visible 10 or 15 miles away.

The President—In a trip to Newburgh I have been able to count 400 or 500 vessels, and at night many of these show no light at all. The sinking of one or two crowded steamers will some day wake up our Legislature to the necessity of some law on this subject.

Mr. Fisher—It very often happens on a small vessel that there is no one to see the danger. The helmsman has his duty to attend to, and the watch goes to sleep.

Mr. Garbanati—A few days ago there was given in one of the newspapers a list of vessels which had gone to sea and were never heard from again. If the neglect of a duty on shipboard by which the ship was imperiled were made a crime by law, watches would be more wakeful, and lights might be seen, which otherwise were invisible.

Mr. Bruce—During a trip to New Orleans on the packet ship *Yazoo*, I went on deck one night and observed a faint light over the starboard bow. There was a lookout at the mast head, but he had lashed himself to the mast and gone to sleep. I brought an officer up from below, but he could not see the light at first, in a minute or two it was found that we were in great danger, and had barely time to change our course and be safe. I had the credit of saving the ship.

Lieut. Bartlett—This was a case of gross neglect on the part of the look-out. It could not happen on a government vessel; every ten minutes the officer of the deck calls, "bright look-out ahead," and the look-out must answer. On smaller vessels, however, where men are obliged to keep watch and watch, they cannot always keep awake on their watch. And this fact is a stronger reason for bright lights.

The subject for the next meeting's discussion is the report of the committee on "Cut-off Experiments."

VENTILATE THE SHOP.

[Communicated to the Scientific American.]

Few things are more insidiously undermining the constitution and vital stamina of many "young people" than the want of shop-ventilation, particularly in the evening, when the gas is lighted. This subject cannot be discussed at a time better than when the shop windows gradually begin to be closed against the approaching cool weather.

There are many trades, the occupation in which is very light and requires little or no exertion. Stationers, fancy wool, toy shops and the like, nearly all keep their doors closed "because it is so cold;" the result is that the burning gas vitiates the air in the shop, and the assistants inhaling this, the circulation of the blood is lowered, and the outward cold is felt all the more. Again, their are some shops the contents of which naturally yield emanations of an unhealthy kind, when a free current of air is excluded. Who, for instance, can go into a shoe shop, the doors of which are kept closed, without at once discerning the unpleasant odor of old and new leather? The same may be said of a ready-made clothes depot; the peculiar odor of the cloth and fustian, the burnt gas, and the confined breath of the people serving therein, make it exceedingly disagreeable to a stranger on entering out of the fresh air. If a remark be made by a purchaser that the shop "smells close," the assistant is almost sure to reply that "they don't notice it." What, however, they do notice, is headache, langour, loss of appetite, ennui, debility, palor of the face, blotchy skin, redness of the nose, white face, all unheeded warnings to ventilate the dwelling-place, which if not attended to, produce worse results.

Many tailors' shops are very ill ventilated; some, where they drive a good trade, have been enlarged by the addition of neighboring houses, all the fire-places have been removed, and but one or two entrances are left to the whole building, and the doorways are cramped up with goods in a manner that positively keeps customers away. There are on the other hand many trades where the door is always open; the result is that all engaged in it are healthy, and never complain of being cold. Look at the butcher boy, blooming and healthy; furniture dealer, taverners, and many other occupations are, as a general rule, healthy, because of the free ventilation of their shops or places of trade.

The nose is the gate to the lungs, and whatever is indicative of unpleasantness is unhealthful, and should be shut out. Instead of closing the doors to keep the shop warm, it is better, if the cold is severe, to wear warmer underclothing—half-gloves, thick stockings, warm jackets, and wooly neekerchiefs. In winter dress accordingly in warm clothes and plenty of them. Sufficient attention is not paid to this matter. We put on dark colored clothes and think they are warm; in summer we wear light colors because they look cool; but what is required is thick or thin clothing as the season varies. It is thus only that we may defy the effects of excess in heat and cold. Arising from well-known causes cold air, particularly fresh air, warms the person that breathes it more than warm air. It is proverbial that a person sitting quietly in a room "feels a draft" from every cranny. "The key-hole blows enough to turn a mill," though they "creep into the fire," and roast themselves, they have always one side cold, yet a little exertion in fresh open air would put them into a glow.

As gas burns, and people breathe, water is produced and exhaled; if this steam be seen condensed on the inside of windows, you may be sure the shop wants ventilating. Dust of every kind should also be avoided with scrupulous care. Every morning when the shop is dusted, doors and skylights should always be wide open so as to clear away the dust as it flies about. It avails but little to dust without getting rid of it out of the premises; to make a dust with a brush in one place for it to settle in another is labor in vain. Persons who take a morning or evening draft of dust are sure to be troubled with air-tube complaints. This then is another reason to ventilate the shop.—SEPTIMUS PIESSE.

COATING PATTERNS.

MESSRS. EDITORS:—In answer to an inquiry, in a late number of your valuable paper, for a substitute for wax, in coating patterns. I would state that I have used on patterns that require any quantity, the ordinary gas-fitting cement, and find it an excellent substitute. T. S.

Philadelphia, Pa., Sept. 10, 1860.

[Wm. L. Wemmell, of this city, says that Prince's metallic paint, which is composed of 72 parts of oxyd of iron to 28 parts of cement lime stone, when mixed with shellac and applied to patterns, forms a very durable coating. H. B. Weaver, of South Windham, Conn., says, the best and cheapest coating I have ever used is composed of a solution of gum shellac in alcohol, with equal quantities of red lead and venetian red by weight, sufficient to give a light red color to the solution; then add a small quantity of Venice turpentine to prevent the lead and venetian red from setting.

ANNEALING STEEL.

MESSRS. EDITORS:—I see an article headed "Tempering Steel," on page 135, Vol. III. (new series) of the SCIENTIFIC AMERICAN. I have observed with surprise that many blacksmiths, as well as others, are ignorant of the fact, that if you dip steel at a red heat which is barely distinguishable in a tolerably dark place, such as the bottom of a tub, it will thoroughly anneal, and that you can in that way anneal steel which will scarcely anneal in any other way. JOURNEYMAN.

Rome, Ga., Sept. 7, 1860.

KEEPING SWEET POTATOES.—A correspondent who has had experience in the matter, informs us, that the keeping of sweet potatoes depends mainly on the kind of land in which they are grown; sandy land producing tubers which keep the best.

TALK WITH THE BOYS.

No. 5.—Carbonic Acid all Alone—The Science of Burning Lime—The Metal In the Greek Slave.

"Do you want my mouse, father?"

"Yes, you may bring him up and have him ready here. But first we will have Charles' marble dust and acid; and, John, ask your mother to send up three or four white preserve jars."

"Are you going to get carbonic acid out of sulphuric acid, sir?"

"No; I am going to get it out of marble dust. There is water in marble as there is in almost everything else; but apart from the water (and impurities), every 50 lbs. of marble consists of 22 lbs. of carbonic acid and 28 lbs. of lime. It is the carbonate of lime. If it was a combination of carbon alone with lime it would be the carburet of lime, but combinations with carbonic *acid* are called carbonates. The lime is composed of oxygen and a white silvery metal called calcium. Calcium, like all the metals, is a simple substance, and you may make a ball, Charles, to represent its atom."

"How heavy must it be, sir?"

"An atom of calcium is a little more than 20 times heavier than an atom of hydrogen, but we will omit the fractions and call it 20 times. It is of the same size. An atom of lime is composed of one atom of calcium, combined with one atom of oxygen; and as the atom of oxygen weighs 8 times more than an atom of hydrogen, the weight of an atom of lime is 28. An atom of carbonate of lime is composed of one atom of carbonic acid which weighs 22 and one atom of lime weighing 28, making the weight of an atom of carbonate of lime 50; so that, in 50 lbs. of pure carbonate of lime, 28 lbs. are lime and 22 lbs. are carbonic acid."

"Shall I mark the calcium ball C?"

"No. You have already marked the carbon ball C; you may mark this Ca, and CaO will stand for oxyd of calcium or lime. Have you mixed some water with the sulphuric acid, as I told you?"

"Yes, sir, and it made the bottle very warm."

"Now, pour some of the sulphuric acid upon the marble in the jar."

"How it foams! Look, John."

"Roll up a piece of paper, John; light it at one end and hold the lighted end in the jar."

"What makes it go out so quickly, sir?"

"The carbonic acid, which has been separated from the marble by the sulphuric acid, has filled the jar, pushing out all the air, and nothing will burn in carbonic acid. Throw another handful of the dust into the jar, pour in a little more acid, and then put in the cork that has the india-rubber tube through it, and bend the other end of the tube over into another jar. Now, as the carbonic acid continues to separate from the lime it will flow through the tube and fill the second jar."

"What makes carbonic acid separate from the lime?"

"Lime has a stronger affinity for sulphuric acid than it has for carbonic. Sulphuric acid is a perfect old Turk; it wants to wed itself to everything that it meets. When it comes in contact with lime, it serves it in the same way that the Roman solders of whom you were reading did the inhabitants of Messina."

"How was that, Charles?"

"They drove off the men, and took possession of their houses and wives."

"Carbon and oxygen are so perfectly united with each other, that they do not care much for other things. Carbonic acid may remain in quiet combination with lime for thousands of years; but if anything that the lime likes better touches it, or if the lime gets into a hot place, the carbonic acid leaves. When you pour the sulphuric acid upon the marble, the lime of the marble enters into combination with the sulphuric acid, and the carbonic acid passes off in the form of gas. The combination of the sulphuric acid and lime forms the sulphate of lime, the same as gypsum or plaster-of-paris."

"Is that jar filled now with something that we cannot see, that 10 minutes ago made a part of solid marble."

"Even so."

"That is very curious. And the solid part of the marble is a metal?"

"The metal is no more solid than the carbon and oxygen, when all three are combined in the marble. Pure carbon, when it is crystallized, is the very hardest substance known. It is then called diamond."

"What sort of a metal is calcium?"

"It is a white metal; it looks somewhat like silver. Its affinity for oxygen is so great that, in the open air, it combines with it very rapidly; in other words, burns right back into lime. This property of oxydizing so readily, entirely destroys the value of pure calcium, though, when combined with oxygen, forming lime, it is of great value for many purposes."

"I never knew before that there was a metal in marble. Has all marble got this metal in it, father?"

"Yes. All marble is the carbonate of lime. Powers' statue of the Greek slave, if it was heated red hot so as to drive off the carbonic acid, would yield about half its weight of first quality lime, suitable for mortar or for white washing. Marble is, in fact, the ore of the metal calcium. Nearly all the rocks, as well as clay and earth, are metallic ores. Try your lighted paper in the mouth of the second jar, John, and see if that is full yet of the carbonic acid."

"Yes, sir, it puts the paper right out."

"Bring your trap then and drop the mouse into it. Is he alive?"

"Yes, sir; he has eaten up all the pumpkin seeds that I gave him. Shall I open the trap and drop him into the jar?"

"Yes; let him go in. How he clings to the wires."

"Why, father! What is the matter with him? He is dead!"

"Yes. I knew he would not live long in that jar. No breathing creature can live in pure carbonic acid. Take up the jar, Charles, very steadily, and pour the gas on the flame of this candle; steadily now, just as if you were pouring water."

"Why! Was that the carbonic acid that put the candle out?"

"Certainly. You did not blow it out did you?"

"No; but it is so strange that I can pour a gas which I cannot see."

"You find this carbonic acid rather a curious substance, do you not? I have explained to you how firmly the carbon and oxygen that compose it are bound together, but next week we will follow it into the growing leaf, and discover the two blades of the invisible shears, that, like the shears of fate, sever even this union asunder.

THE NOISE OF THE AURORA BOREALIS.

Messrs. Editors:—Since reading in your issue of the 18th inst., the account which Mr. Thompson, of Illinois, gives of the "noise of the aurora borealis," which came under his observation in 1815, I am induced to record a fact of the same sort, as additional proof on that subject.

In December, 1848, one evening during a brilliant display of the aurora borealis, the streamers were of unusual size and brightness, and as they flashed across the sky they were attended by precisely the same sort of sound which your correspondent describes, viz: "the soft, crackling sounds produced by the shaking of a sheet of fine tissue paper." While looking at a blank space in the sky, it would be suddenly lighted up by those meteoric streamers, attended with such a rustling, hissing noise that there could be no mistake of its proceeding from them.

Sometimes, during the evening, the noise was incessant, and, though not loud, it was as if numberless sheets of fine tissue paper were shaking or being torn in the air above. This phenomenon was *seen* in northern Indiana, but whether *heard* by many, I am unable to say.

Isaiah M. Lee.

Yellow Creek, Ind., Aug. 21, 1860.

Seeing Stars in the Daytime.—On the 13th inst., at noon, we noticed, from our office window, crowds of people collected in Beekman-street, looking at a star which was plainly visible in the sky, though the sun was shining brightly at the time. We took a look at it, and, from its position in relation to the sun, it must have been the planet Venus.

Grinding Mill Wanted.—W. S. Lewis, of Shreveport, La., writes to us as follows:—"Permit me to inquire if a mill of any kind has been invented to successfully grind the corn in the ear (shuck and all) into cow feed; the great difficulty is in grinding the shuck so that the mill will not choke."

A COLUMN OF VARIETIES.

It is now fully established that the silver mines in California surpass in richness and extent all silver mines heretofore known in any part of the world, as much as the gold of California, at the time of its discovery, surpassed all gold mines previously known.

In England the business of operating the telegraph has been, to a very great extent, placed in the hands of young ladies, who find it very agreeable employment. The inland department of the Electric Telegraph Company in London now employs one hundred young ladies, who receive and transmit the messages from all parts of the United Kingdom.

Mr. Richardson communicates to the London *Lancet* a new mode which he has discovered for extracting teeth without pain. It consists in immersing the affected part in cloroform, which is done by filling a little cup half full of cotton wool, saturated with chloroform, and placing it over the tooth. It takes from seven to fifteen minutes to produce the effect.

The lantern of the North Foreland light-house, in England has been lighted by the electric light for the last six months. The electricity is obtained by magnetism, there being two sets of helices and three wheels of magnets, which are driven by a two-horse power engine. The light is visible from the coast of France, and has not once failed of doing its duty during the six months.

Cushman & Co., in Amherst, Mass., are manufacturing about fifteen hundred pounds of artificial leather daily, from scraps of leather and old pieces of rope. It has not been introduced out of New England, yet the demand is reported to be greater than the supply. The process of making is similar to that of manufacturing paper.

How to Cook a Beefsteak.—The following were the rules adopted by the celebrated "Beefsteak Club," started in England in 1734:—

"Pound well your meat until the fibers break;
Be sure that next you have, to broil the steak,
Good coal in plenty; nor a moment leave,
But turn it over this way and then that.
The lean should be quite rare—Not so the fat.
The platter now and then the juice receive,
Put on your butter, place it on your meat,
Salt, pepper, turn it over, serve and eat."

There are sixty-four inmates of the Ohio State Prison, at Columbus, under sentence for life, one of whom has been confined twenty-four years, nine others more than ten years, etc. Of these, ten are hopelessly insane, others are on the last verge of insanity, and the tendency of nearly all is to monomania and despair—facts calculated to inspire the belief that life-sentences are by no means cheerful punishment.

The schooner Caroline E. Foote has arrived at San Francisco, from the Amoor river, with fifteen Tartar camels (two humped) to be used in transporting goods in Utah. Eight of them are males and seven females. There were thirty-two of them, but seventeen of them died last winter when they were frozen fast in the Amoor. Since getting to sea they have all done well. They are large, healthy, hardy animals, capable of carrying one thousand pounds each, and are excellently suited to the business of packing.

Dr. Winship, the strong man of Boston, who has brought himself up, by training, from a weakly condition till he is able to lift 1,100 lbs. and to shoulder a barrel of flour, says, that in the course of his training he has discovered that forty minutes exercise once in two days is better than twenty minutes every day; that lifting is the safest and surest method of producing harmonious development; that the performance of twenty gymnastic feats once is better than the performance of the same feat twenty times; and that it is best to eat heartily of such food, animal and vegetable, as agrees with the stomach.

Before referees, a suit has been brought by F. O. J. Smith, against Professor Morse, to recover five-sixteenths of the amount of money received by Professor Morse from the different governments of Europe for the invention of the telegraph. The parties have been connected together in the telegraph business for some twenty years, and some time since a settlement was had between them, when Mr. Smith received $300,000, and here matters in dispute were left open for suit or reference, of which this is one. The hearing is not finished. The referees are Judges Sprague and Upham and George S. Hillard.

IMPROVED HAND DRILL SEED PLANTER.

A considerable number of hand seed drills have been patented, but for some kinds of seed, or in some circumstances, or in the opinion of some farmers, they have none of them proved to be just what was wanted; we here illustrate another attempt to produce a planter which will give satisfaction under all circumstances, or at least in some conditions where others have failed.

BARBER'S IMPROVED HAND DRILL SEED PLANTER.

The seed is placed in the hopper, A, the bottom of which is closed by a slide, *b*, which is pressed inward by a flat spring extending down through the middle of the hopper from the the top. The slide reaches through the hopper, and its forward end is perforated with a hole for the seed to fall through when the slide is drawn backward so that the hole may come within the hopper. A vibratory motion back and forth is given to the slide by means of the arm, *c*, which is connected rigidly with the rocking bar, *d*. The two levers or hooks, *e e*, are firmly secured at one end to the rocking bar, *d*, while their opposite ends rest upon the ratchet wheels, *f f*, which are fastened upon the shaft of the driving wheel, G. One of the wheels, *f*, has twice as many teeth as the other, and the hooks, *e e*, are made to turn in the rocking bar, *d*, so as to bring either one or both of them upon its ratchet wheel, thus varying the frequency of the vibrations of the slide, *b*, and consequently the quantity of the seed planted. It will be seen that the plow which opens the furrow, and the two scrapers which follow and cover the seed, are all so connected with the frame that their hight may be adjusted, and the angle of the scrapers may also be varied at pleasure.

This is a very simple planter, compact and not liable to get out of order, and the vibrating spring in the middle of the hopper stirs the seed so constantly that it cannot choke in the delivery.

The patent for this invention was granted, through the Scientific American Patent Agency, on Sept. 4, 1860, and further information in relation to it may be obtained by addressing the inventor, W. H. Barber, at Wolcottville, Conn.

APPLICATION FOR THE EXTENSION OF A PATENT.

Circular Shears.—William Bulkley and Philip Norton of New Berlin, Conn., have applied for the extension of a patent granted to them on the 28th of November, 1846, for an improvement in the above-named class of inventions. The testimony will close on the 9th of October next; and the petition will be heard at the Patent Office on the 12th of November, 1860.

WOMAN'S ENTERPRISE AND PERSEVERANCE.—In the first volume of the new series of the SCIENTIFIC AMERICAN, page 201, we gave an illustration of an improved steam engine, patented by C. A. Schultz, of this city. This engine was afterwards exhibited at the Fair of the American Institute, where it attracted a great deal of attention and was generally regarded by engineers as a good thing. The valve is connected with the governor so as to regulate the speed by changing the point of cut-off, as in the Corliss & Nightingale engine. Last February, while Mr. Schultz was starting one of his engines at West Cummington, Mass., he carelessly stepped upon the main driving belt and was instantly killed, leaving his widow with no property except the patent right. Mrs. Schultz has not despaired under these sad circumstances, but has persevered to carry the enterprise through, and now has a 10-horse power engine in operation at the Neptune Iron Works, in this city. Being short of funds, she would like to sell a portion of the patent right—either an undivided interest, or the whole for some of the States. Communications on the subject, addressed to the Neptune Iron Works, New York, will receive attention.

SELFRIDGE'S IMPROVED PUMP.

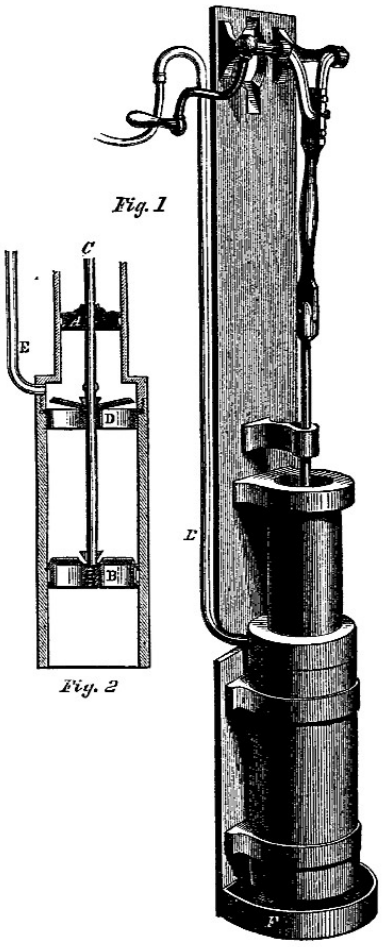


Fig. 1

Fig. 2

After all the hundreds of pumps that have been invented, it is surprising to see a new and simple combination of cylinder, piston and valve, by which a suction, lifting and force pump is produced. This case affords a striking proof of the unlimited field which is open for new combinations in mechanism.

In the pump here illustrated, a solid piston, A, and movable valve box, B, are attached to the same piston rod, C, which works through a stationary valve box, D. Both of the valve boxes have passages through them, which are closed by flap valves opening upward. The water enters at the bottom of the cylinder, and passes out at the pipe, E. It will be seen that by placing the pump in the well and allowing a trifling leak in the boxes, it will not freeze; while by packing the boxes tight, and placing the pump in the house, it will act as a suction, lifting and force pump. The cup, F, at the bottom enables the pump to be placed to the very bottom of the well, for the water, all passing over the upper edge of the cup, is not mixed with the sand and other solid substances by which the pump would be choked. It will be seen that the piston is operated by means of a crank and connection rod. The perfect simplicity and convenience of this pump, in combination with its varied action, are the qualities which commend it to the community.

The patent for this invention was granted through the Scientific American Patent Agency, on Sept. 4, 1860; and further information in relation to it may be obtained by addressing the inventor, George C. Selfridge, at North Greenfield, N. Y.

DENTIFRICES.

MESSRS. EDITORS:—Very few persons seem to understand that the teeth are among the most important organs of the human system; consequently, millions of people are cursed with bad teeth and disordered stomachs. Hence a thousand ills.

While the subject of dentifrices is being agitated through the kind influence of your valuable journal, you would confer an endless blessing by discovering and making known the proper dentifrice to be used under all circumstances.

The article written by "C. C. T." (page 148, present volume of the SCIENTIFIC AMERICAN), partakes of the general views of the best authors and leading dentists of the country. We may deduce from it that almost all dentifrices are either inefficient, or injurious, or both. I am certain, however, that "C. C. T." will find that "hot water and brush" are inefficient in a majority of cases. It needs a dissolvent to neutralize the calcareous sediment which is constantly collecting about the necks of, and between the teeth. The present styles of brushes cannot reach it; "chalk and stick" cannot do it; and it should not be left for the dentist to remove mechanically. A soft brush and gentle astringent wash used daily, chalk and stick when actually required, then consult an intelligent dentist at least twice a year, and there will be fewer false teeth required for the next generation. Every intelligent dentist knows better than to prescribe acid or alkali; soon they will know better than to recommend charcoal and soap.

A. H. T.

Lamberville, N. J., Sept. 1, 1860.

[Almost the only perfect set of natural teeth that we know of among our acquaintances, are those of a lady who has used charcoal regularly for the last thirty years.—EDS.

THE *Great Eastern* consumed 2,877 tuns of coal during her voyage to this city.

Scientific American.

MUNN & COMPANY, Editors and Proprietors

PUBLISHED WEEKLY

At No. 37 Park-row (Park Building), New York.

O. D. MUNN, S. H. WALES, A. E. BEACH.

TERMS—Two Dollars per annum—One Dollar in advance, and the remainder in six months.

Single copies of the paper are on sale at the office of publication, and at all the periodical stores in the United States and Canada.

Sampson Low, Son & Co., the American Booksellers, No. 47 Ludgate Hill, London, England, are the British Agents to receive subscriptions for the SCIENTIFIC AMERICAN.

☞ See Prospectus on last page. No Traveling Agents employed.

VOL. III., No. 14....[NEW SERIES.]....*Sixteenth Year.*

NEW YORK, SATURDAY, SEPTEMBER 29, 1860.

WORKING STEAM EXPANSIVELY.

SHERWOOD'S work, "Engineering Precedents," which was noticed at length on page 57 of our last volume, and some recent experiments at a large flouring establishment in this city, called the Metropolitan Mills, have caused a lively discussion among a portion of our engineers in regard to the economy of working steam expansively.

The subject has been so thoroughly examined and so ably discussed, that it was generally regarded as entirely settled, and few, if any, of our engineers entertained a doubt that there is great economy in working steam expansively. But as Mr. Isherwood is Chief Engineer of the United States Navy, as his conclusion that there was little, if any, economy in expansion, was derived from a long series of experiments made at the Brooklyn Navy Yard, and as this conclusion has been confirmed by an independent series of experiments at the Metropolitan Mills, a small number of our engineers have adopted the new faith, and have succeeded in getting the whole subject re-opened for fresh examination by the community. The Polytechnic Association of the American Institute have taken it up, and have appointed a committee to report on the value of Isherwood's experiments.

Those of our readers who are familiar with the accounts of the laborious investigations that have been made by Regnault, Rankine, and others, in regard to the generation of heat, the evaporation of water, and the working of steam, are well aware that an exhaustive treatise on the subject would fill whole volumes of our paper. There are, however, a few leading facts which seem to us to be the controlling ones in the case, which may be very briefly stated.

If we take a long, upright cylinder, with a bore equal to a square inch in size, put a cubic inch of water into the lower end, place an air-tight piston over the water, and apply heat, then the following effects will be produced. If the weight and friction of the piston are balanced by a pulley, the piston will remain at rest until the water reaches a temperature of 212°, when the production of steam commences and the piston begins to rise. While the fire is burning long enough to impart 1,000° of heat to the water, the evaporation goes on, pushing up the piston, and raising it, by the time all the water is evaported, 1,700 inches. During this process, the steam and water remain at the temperature of 212°, all the heat that is absorbed being rendered latent.

If we load the piston with a weight of 15 pounds, it will not rise till the water reaches a temperature of 249°, and when the water is all evaporated, the piston will have risen only 850 inches. Again doubling the load, adding 2 more atmospheres of pressure, by placing 30 pounds additional on the piston, requires a temperature of 291° before the commencement of evaporation, and the weight is raised only 425 inches in hight; the larger weight being raised to a less hight, and the amount of work accomplished by the same heat being equal in the several cases. The fact which has been regarded as settling the question of the theoretical value of expansion is plain from the above statement, When steam has raised a load of 45 pounds 425 inches, if 30 pounds is taken off, it will raise the remaining 15 pounds 425 inches higher, and this last work, which is performed by expansion, is a clear gain over that which would be done by the same heat, if the steam were discharged under full pressure, that is, worked without expansion.

This relation of heat, steam and work which has been proved by numerous and careful experiments, is confirmed by the general experience of engineers in the practical running of steam engines. There can be no doubt that a minute examination of all the details of the experiments at the Metropolitan Mills and of those made by Mr. Isherwood, would reveal the cause of their differing in result from all others. That the Navy Yard engine was a very imperfect one is proved by the fact that it consumed from 11 to 14 pounds of coal per horse power per hour, while engines have been made that run with a consumption of less than 2 pounds. We think it will require more nicely conducted experiments than those which have been recently made in New York and Brooklyn, to weaken the great mass of accumulated proof that there is economy in working steam expansively.

THE RIGHTS OP JOINT PATENTEES—A REVIEWER REVIEWED.

We have in two previous numbers, (at page 42 and 121 of the present volume) stated some difficulties connected with this subject, and endeavored to solve those difficulties as far as we felt confident of being correct. When we entertained doubts we have frankly confessed them, in the hope that some abler pen would come to the rescue.

One of our cotemporaries, the *Practical Mechanic*, has kindly undertaken this office, and with a confidence indicative of a consciousness of completely understanding the entire subject, has gone on, not only to explain the difficulties, but to smile at the doubts suggested in our previous articles. While we are disposed to take the *will* for the *deed*, and to return our acknowledgments to our cotemporary for its kindness in coming to our relief, as cordially as though we could feel fully profited by its instructions, we cannot but suspect that its confidence of tone is not altogether the offspring of knowledge, but rather of the want of information on the subject. Freedom from doubt is as often the result of not understanding a difficulty, as it is of a consciousness of having met and fully overcome it.

In one of our previous articles we had made the statement that unless an inventor had parted with his entire interest, the patent must issue in his own name. This is stated by our cotemporary to be "more palpably erroneous because entirely false in fact." The reason thus given by it is certainly sufficient if correct. Let us see whether this is so.

We did not mean in what we have stated on this subject, that a patent could under no circumstances issue to the inventor jointly with other persons. He may assign the whole invention to a company in which he is a stockholder, or to a firm of which he is a partner, or he may make an assignment to himself and one or more others as joint owners, and the patent will issue accordingly. In all these cases the assignees of the *entire* interest although the inventor is included among them will be entitled to the patent. But in that case the inventor holds, not as inventor, but as assignee. The assignees hold the entire interest. Our language we presume was not misunderstood, but for greater certainty we thought proper thus to define our position more accurately.

Our cotemporary, among other valuable matter, informs us in its last number, that it is the uniform practice of the Patent Office, "when the patentee (we suppose it means inventor) assigns *half or any portion* of his patent (it should be invention) to some friend who is to advance money in the matter, or for some other reason—the application and specification are made out and sworn to by the inventor, who in the assignment makes request that the patent may issue to both. The assignment is sent to the Patent Office for record, with the application, reciting that the assignee is the inventor, &c., and the patent issues to both. It is difficult to believe that many patents have not been issued in this way under the agency of the SCIENTIFIC AMERICAN."

This certainly is a very curious paragraph, and bears evidence of having been written by one who, at least, esteems himself thoroughly conversant with the subject. The writer, however, may find some trouble to make others, who are familiar with it, believe what he states. It may be difficult for him to believe that patents have not been issued in this way, but it may be more difficult for him to find a single one ever so issued, and what he means by "*reciting that the assignee is the inventor, &c.,*" is to us a complexity.

It also states that the weekly patent list shows that many patents have in this way been issued under the Scientific American Patent Agency. If so, we are wholly ignorant of the fact.

As far as our information extends (and we always try to understand our own business), no patent is ever issued by the office to an assignee until the entire interest has been assigned to him. The Attorney-General of the United States gave an opinion to that effect some years ago, and the rule has, as we believe, been invariably followed by the Patent Office ever since. So that if A makes an invention and assigns one-half to B, and then applies for a patent, requesting the office to issue the patent to himself and B jointly, the request will not be granted. To obtain a joint patent, in such a case, A must assign the invention to himself and to B jointly; A and B being then the joint assignees of the entire interest will receive a joint patent. The reason of this is that none but the assignees of the entire interest will be entitled to the patent instead of the inventor himself. If he has assigned his whole invention partly to one person and partly to another—by separate and independent assignments—or if he has assigned a portion of his invention to one or more persons, retaining only a part, however small, to himself, the patent will, as we understand, always be issued to him alone, and the title will afterwards flow from him in the proper channel.

This construction of the law has been adopted by the present Attorney-General of the United States in a case which arose in the office less than a year since. One Wilson Ager had invented a machine for hulling and cleaning rice, and had assigned his invention to Wolf & Jordan, of the city of Philadelphia. The assignment was somewhat vague, and admitted of two constructions. By one of these it was complete, and embraced the whole United States; by the other, the city of New York, and perhaps some other small fraction of territory would be reserved to the inventor.

The assignees applied to have the patent issued to them at once. The Commissioner adopting the latter of the two constructions above-stated, declined to comply with this request, but finally consented to refer the question to the Attorney General, who, after much hesitation and examination, finally concluded that the assignment embraced the whole United States, and recommended that the patent be issued to the assignees, which was accordingly done. Our cotemporary is wholly unconscious of any difficulty in a matter which called into requisition all the legal acumen of the highest law officer of the goverment, and one of the ablest lawyers known in this or any other country.

However much, therefore, we may be disposed to respect the opinions of our cotemporary, especially when expressed with such apparent consciousness of infallibility as runs through the several articles with which it has favored us, we hope to be excused if, on this occasion, we do not feel justified in availing ourselves of the information which it seeks, so kindly, to impart.

In our previous article, on page 121, we had alluded to a difficulty which might arise in regard to the re-issue of a patent which had been partially assigned. Our cotemporary, with its accustomed promptness, conclusively disposes of this difficulty by calling our notions absurd. We are told that, in such cases, the assignee can obtain a re-issue with the same facility as the original patentee. We certainly should have been better satisfied if we had, at the same time, been informed of the process by which this result was to have been produced, but that seems to have formed no part of the plan of our cotemporary.

For instance: A patentee assigns a fraction of his patent. The assignee, satisfied that it is not in the proper shape, desires to have it re-issued. How is he to proceed? Our critic will tell us that he must apply to the Commissioner of Patents, in accordance with the 13th section of the act of 1836; but how can he do this? That section renders it necessary that, before a re-issue can be obtained, the original patent must be surrendered up. How can the assignee surrender what he neither

possesses nor has any right to possess? The patentee is entitled to the possession of the patent in which he still retains an interest. He may refuse to surrender the patent, either because he thinks the old one better than its proposed substitute, or for any other reason. He may, however, in this judge erroneously, and by his obstinacy, may greatly prejudice the interests of the assignee. Our critic will doubtless, with its usual readiness, point out a perfect remedy; but to us the case seems to present a difficulty, for the removal of which the present law does not appear to have made any very plain and adequate provision.

Our critic speaks of the question with which our first article was commenced as being "very confusedly expressed." It certainly is so as set forth in his quotation of that question; but we think this objection will vanish whenever the objector will take the trouble to read that question on page 42 of the present volume of the SCIENTIFIC AMERICAN. The quotation made by our cotemporary, though included in double commas is wholly unlike the original both in its language, and in the order of its arrangement. The entire transposition of the sentence, and the use of other words, make it entirely different from its scope and meaning as penned by its author, which is certainly a somewhat extraordinary method of criticism.

We might continue this notice of the articles referred to much further, without finding cause to change any of our previous notions on the subject of which they treat. In no essential particular have we felt justified in overlooking the difficulties or abandoning the doubts previously alluded to by us.

We do not, however, wish to discourage our cotemporary in its very commendable efforts to throw light upon these subjects so interesting and important to the public. It has evinced one very valuable quality—that of self-reliance. All that is now necessary is the necessary knowledge of the subjects on which it treats to render itself highly useful to inventors, and to the world. It carries out one branch of the sound maxim of a distinguished American hero, statesman and philosopher, by going ahead. It has only to pursue with success the other branch, in order to prove itself a worthy disciple of so celebrated a teacher. The extreme youth of our cotemporary will fully account for its verdancy in such matters, and entitle it to much forbearance.

OUR SPECIAL CORRESPONDENCE.

THE UNITED STATES AGRICULTURAL SOCIETY'S FAIR.

CINCINNATI, O., Sept. 14, 1860.

MESSRS. EDITORS:—The eighth annual exhibition of the National Agricultural Society opened at the Trotting Park, near this city, on Wednesday. The due form usually consists of an address by the President, setting forth the history and aims of the society, and the circumstances which induced its officers to locate the annual fair at the city at which he may be speaking. This year there was a slight departure from the rule, since the chairman of the local business committee made the long speech and the president the short one. The Hon. Henry Wage, of Rome, N. Y., at present the incumbent of the presidential chair, is a working rather than a talking man, and hence his speech may be fairly designated by those two threadbare Latin mottoes "*e pluribus unum*," and "*multum in parvo*." Reduced into English, the pith of the address was, that "they had done as well as they could to make a fair, and meant to continue in the same labor of love." I wish to imitate the example of Mr. Wage, so I will waste no more time in preface but proceed to business.

The fair grounds comprise within the fences about 60 acres of level, well-turfed land, around the outskirts of which runs an excellent trotting track, forty feet in width. Within this ring are located the various tents and wooden structures usually found at fairs, but all rather more capacious than is found to suffice for minor shows. The "Power Hall," which was erected under the superintendence of Mr. W. R. Fee, of this city, is 200 feet by 80, and made as strong as it well could be. They have adopted the plan of putting the line of shafting near the ground, and thus enabled themselves to repair, or remove with great ease, any pulleys which may get out of order, besides avoiding that racking which these temporary structures always experience when the shafting is aloft. The 200 feet of shafting is about all occupied, and some of the machinery is highly creditable in appearance and successful in function. One novelty which I never saw at an agricultural show is the large three-roller sugar mill, whose rollers maintain their steady revolution all day long, by the aid of the splendid 70-horse power engine from the Niles Works in this city. The cane-carrier is 90 feet long, and the bagasse-shool 40 more, so that the whole apparatus stretches, partly inside partly outside the building, over 140 feet of ground. The ponderous rollers are double-geared to give regularity of motion, and the beauty of the plan was fully attested by a Louisiana sugar planter with whom I stood for a half-hour examining it to-day. The engine is made as usual with a slide valve, but has a constant quantity of lead preserved at any position of the cast-off—an improvement introduced by John Whetstone, formerly of the Niles Works. The constant lead is effected by the use of a simple rod attached to the pendulum which works the pumps, but you will see that the same end would be secured by its attachment to any other part of the moving machinery. The mill and engine complete makes what they call "the $10,000 job."

Close by the cane-mill is a rotary draining pump just invented, and now first tried, by E. Reynolds, of Aurora, Indiana. It embraces a combination of the centrifugal and screw principles. The pumping is done by an encased conical screw, or double cone with the apices outward, and the water, which is sucked through two tubes of 11 inches, is discharged through one pipe of 14 inches very successfully. It was hard at work today, and really threw the 14-inch stream from the very start. It seems to me as if the work must be accomplished with great loss of power, but certainly it was faithfully performed. It is said to discharge 12,000 gallons per minute when working with 90 pounds of steam. You perceive that the double cone balances the end thrust of the shaft, and the water acquiring a certain amount of rotary motion from the cone, a large quantity of water is discharged by a moderately small machine.

John Walker, of Mount Vernon, Ohio, shows a "locomotive cross-cut steam saw-mill" of 5-horse power, which is intended to go into the woods and "butt" logs. It is very rude so far as workmanship goes, and to my notion quite as objectionable in respect to flimsiness as the Van Doren & Glover "steam plow," to which your readers were introduced last year. In fact, it seemed a twin-brother to that ill-favored peripatetic engine. On this machine the upright boiler, water tank, and engine, are all placed on a single 3 wheeled wooden frame. By gears on the inner face of the spokes the wheels are connected with the engine, and thus make the machine self-propelling. When it is desired to turn around one of the drivers is thrown out of gear and the other travels around it, while the single castor at the other end of the frame follows around the curve, *nolens volens*. If the inventor had attached his engine to the boiler he might have made it more secure and saved the clumsy wooden frame on which it is now fixed. A fly-wheel at the head of the truck furnishes power for threshing or other farm work, while by attaching the pitman of a cross-cut saw to it the main object of the invention is secured. To-day they sawed some 3 foot logs in a very creditable manner, and no doubt, if properly made, this would be a useful engine for a western farmer.

One very excellent feature in the arrangement of these grounds is the abundant supply of water. Eight large wells have been dug in different parts of the grounds, and thus not only are visitors supplied with excellent drinking-water, and the stock given all they can possibly want, but a large number of engines are thus enabled to display their capabilities where they otherwise could not. Around one well there are at work five large portable saw-mills, and to see the consumption of the huge logs which lie about, a constant crowd keeps close at hand. The large saws are all over 50 inches in diameter. H. & F. Blandy, of Zanesville, Ohio, have a highly-finished engine running a 52-inch saw; Owens, Lane, Dyer & Co.. of Hamilton, Ohio, a plainer engine and a 56-inch saw, Lane & Bodley, of Cincinnati, a stationary engine and a 54-inch saw; and A. B. Holabird & Co., also of Cincinnati, a 50-inch saw. I was agreeably surprised to hear that portable engines are coming into so much more general use among farmers of late. The movement in this direction has but just commenced; the result must be evident to all. The greatest feature of an English "Royal" show is the display of portable engines and threshers. I recollect having seen at Chester the year before last, *one hundred and five* portable engines at work on the Royal Agricultural Society's show-grounds, and fifty-six threshing machines! Here there are not above a dozen portables in all, but how long ago is it when not one could have been found? and how long will it be when we too shall have to report in the SCIENTIFIC AMERICAN, of having seen one hundred or so at one of our national fairs? Not many years, if we have frequent returns of such glorious harvests as this of 1860.

Palmer's (of Cincinnati) rotary draining pump has been before the public several years and had its value tested severely. It is this pump which is used by the New York Board of Underwriters for wrecking, and the eight which are used by them around New York have drawn the water from the hold of many a sunken vessel. It consists of two cast-iron pistons, or concave and convex rollers, revolving in conjunction with each other. It is claimed that all frictional surfaces are compensated for in its own action by means of gibbs and followers, acted upon by the pressure of the water, and thus obviating the use of valves and packing.

The display of mowers and reapers is, of course, large, and embraces the representatives of the established favorites, as well as blushing candidates for the hard-earned favors of this department of industry. In looking over the Reports of the Patent Office, one must be amazed to see the multitudinous patents issued annually for improvements in harvesters. It seems as if inventors supposed there were some great mine of diamonds somewhere, into which each hoped to cut his way with his reaper or mower. I venture to say that if a faithful exposure should be made of the actual expenses and nett profits of the mower and reaper business in America, the public would stand aghast. The fortunes upon fortunes, the comfortable farms, homesteads, or little properties, which have been squandered in the vain search after a novel way to cut grass or grain, strew the way of invention, while a very few men have made themselves rich. True, McCormick piles up his million or so, and Manny's widow draws her $100,000 share per annum from royalties, and Walter Wood makes his hay while the sun shines, and Allen increases his store, and Howard builds him his house; but where are the ninety-and-nine? In truth, it is a picture of human struggles and difficulty in which the darks swallow up the lights altogether.

A novelty, in the shape of a corn-cutter and shocker, is exhibited here by J. H. Rible, of Dayton, Ohio. The machine is about eight feet wide, and drawn by two horses. It cuts the standing maize by means of vibrating knives like those of a mower, and throws it over backward on to a scoop-shaped platform, where the butts are properly arranged by an assistant who stands behind the driver and has a suitable long-handled hook for the purpose. The tops of the stalks lie in a pair of arms, and when enough have accumulated—say 100 to 150 hills—to make a shock, they are compressed by means of a rope and windlass, a binding string is tied around them, and the shock is first raised upward and carried backward by a lever which raises a section of the platform, and then tilted up so as to be discharged on the ground right side up. The machine then drives on and repeats the same operation. It requires two horses to draw the shocker and three men to work it, but it must do its work very rapidly, and no doubt well. If it prove a practicable machine the inventor must make a fortune if he manages his business aright.

The display of plows here is very fair, but not nearly so good as may seen at any Illinois State Fair. J. C. Bidwell, of Pittsburgh, makes a good show, and so do Raymond, Roberts & Helsinger, of Cincinnati; while Hall Brown & Co., of Columbus, have a lot of very well-finished forks huddled together on a box, without any attempt to show them off to advantage.

M. Grover, of Clyde, Ohio, apparently a plain, common-sense farmer, shows a "swing-beam" for attachment to any plow. It consists of a flat iron beam, shaped like a parabola, which is attached to a hook behind the mold-board, just above the shave, and passing through a slot attached to the side ef the wooden-beam, terminates in a hook to which the whiffle-trees are at-

tached. The curved beam being free to move as required, up and down according to the inequalities of the ground over which the team travels, it is claimed by the inventor that the horses are always kept in the line of draft, and that the dynamometer proves a saving of 25 per cent. in the draft of the plow.

Mr. Fee has a cotton-seed huller, and mill to make the oil, on exhibition, but it will not be ready for work until next week, so I must reserve its pen portrait until that time. H. S. O.

RECENT AMERICAN INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions, the reader is referred to the official list on another page:—

SLEEPING COUCHES FOR RAILROAD CARS.

With this invention the seats of a railroad car may be placed about six feet apart, and separated by transverse partitions which form with the sides of the car and draw curtains, separate state rooms, and as each seat has a movable back cushion, the space between every pair of seats may be filled up by placing the back cushions in the same upon supporting cleats; and thus a level cushioned couch, six feet long, be formed within state rooms, by means of the bottoms of the seats and said back cushions for the weary night traveler to sleep upon. During the day, by drawing aside the curtains and turning on the edge the back cushions, comfortable seats are formed. The patent as now re-issued covers the construction of sleeping cars with separate state rooms, in combination with their hinged or unhinged back cushions. Mr. Wheeler, we understand, was the first at his own risk to construct eight night sleeping cars on the New York Central Railroad, and since then the country has been in a blaze on the subject, and well it might be, for night traveling in railroad cars constructed after his patent, is rendered as comfortable as any of our North river steamboats that have state rooms or berths. Eli Wheeler resides at Elmira, N. Y.

TRIP HAMMER.

This invention consists, first, in the employment of an automatic stop mechanism applied to a trip hammer, in such a manner as to insure an equal or given number of strokes of the hammer upon each article of a certain class (different sizes of articles, such as gold pens requiring a different number of blows) thereby subjecting each to the same amount of positive hammering to produce in each of the same class or size, a uniform density of metal, and give control of the elasticity. The invention consists, second, in the employment of an elastic attachment applied to the hammer arm to prevent back lash, and thereby insure a uniform operation of the hammer. The invention consists, third, in a novel and improved arrangement of a hammer arm, socket and head, whereby durability in the hammer mechanism is obtained, and also facility in constructing and keeping the same in perfect working order. The invention consists, fourth, in the use of a convex anvil beds, so arranged as to control or modify the form of articles as may be required, while being subjected to the hammering operation. The patentee of this invention is Alexander Morton, of this city.

MACHINE FOR MANUFACTURING BATS.

This invention is designed for manufacturing bats from those substances which do not readily felt or do not felt at all, and which consequently require other means to compact and cause the bats to adhere together in order to form sheets or bats. To this end the inventor employs what may be termed a press-box, a heating chamber or chambers, and feed rollers, whereby the substance of which the bats are composed is forced through the press-box aforesaid, and formed by compression, under heat, and with any suitable cement or glutinous substance, into proper bats or sheets. This is the invention of W. Fuzzard, of Charlestown, Mass.

STABLE.

This invention is intended more especially for stables where a number of horses are kept. It consists in attaching the horse boxes, racks, &c., to hinged doors, in front of each stall, and applying springs to each door of sufficient strength to open them when the doors are unbolted, one bolt is used to fasten a number of doors, and in case of fire in the stable, this bolt is withdrawn, when the doors will each open and allow the horses to escape from the stable. The credit of this contrivance is due to W. E. McIntire, of Salem, Mass.

TORCH LAMPS.

This invention relates to an improvement in torch lamps which are hung in a gimbal so that they will have a universal movement, and may thus be carried on the end of a staff in an upright position. The improvement consists in using infusible metal, riveted pivots to attract the ring in which the lamp is hung to the socket arms, so that in carrying the torches over the shoulder, the flame will not affect the pivots. The patentee of this invention is C. H. Cooper, of this city.

CASTING PIPE.

This invention is an improvement in casting metal pipe. It relates to a method of bracing the hollow core bar to prevent it from springing in any direction, so that when the pipe is cast it will cool without liability to crack. Alfred Brady, of this city, is the inventor.

HOWE'S EXTENSION CASE.—We have received some correspondence in regard to the editorial remarks on this subject in our last issue, wherein the writers take ground adverse to the views we expressed. It was not received in time for attention this week, but will be noticed in our next.

SEWING MACHINES.—On another page will be found an article on sewing machines. It is the first of a series which we shall publish on this important and interesting subject.

NEW BOOKS AND PERIODICALS RECEIVED.

STEAM FOR THE MILLION. By Captain J. H. Ward, United States Navy. Published by H. Dexter & Co., No. 113 Nassau-street, this city.

This is a small and cheap treatise on the steam engine, especially as it is applied to navigation. It was composed by Captain Ward as an elementary instructor to young seamen, mechanics' apprentices, passengers in steamers, &c. It is a real useful production, and contains a great amount of practical information, conveyed in clear language, which makes it truly a book "for the million."

MATHEMATICAL DICTIONARY AND CYCLOPEDIA OF MATHEMATICAL SCIENCE. By Charles Davies, LL.D., and Wm. G. Peck, A.M. Published by Barnes & Burr.

The title of this book, with the names of its authors, tell us what it is. Now-a-days, when we are obliged to read as we run, dictionaries and cyclopedias are the most valuable of books. We have long felt the need of a dictionary of mathematics. Now we have one, a good one, and a comprehensive one. The book before us comprises 501 pages of closely printed matter, fully spiced with p's and q's and wood-cut illustrations. It is hardly necessary to add that the senior compiler of this volume is the author of the series of mathematical books used in very many of our high schools.

ISSUED FROM THE UNITED STATES PATENT OFFICE FOR THE WEEK ENDING SEPTEMBER 12, 1860.

[Reported Officially for the SCIENTIFIC AMERICAN.]

. Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

30,032—H. A. Alden, of Mattenawan, N. Y., assignor to the New York Rubber Company, for an Improvement in Waterproof Hose:

I claim making flexible tubing or hose, by first lapping around a mandrel, or its equivalent, a strip or strips of flexible material, lined or coated on one or both sides with an india-rubber or other cementing substance, and then drawing on or over the same a similarly coated close or woven tube, substantially as described.

30,033.—Ethan Allen, of Worcester, Mass,, for an Improvement in Breech-loading Fire-arms:

I claim, in combination with the lever, E, that moves the sliding breech, the discharger, F, constructed and operating in the manner substantially as set forth.

30,034.—J. M. Allen, of Fredericktown, Ohio, for an Improvement in Boots and Shoes:

I claim, as a new article of manufacture, a boot or shoe having an india-rubber or gutta percha tip and an india rubber or gutta-percha outsole, made in one piece, and united thereto as described, expressly disclaiming the two things, when separately used or not upon the same shoe, or when made in separate pieces.

30,035.—E. G. F. Arndt, of Rondout, N. Y., for an Improved Portable Door Lock:

I claim, first, The arrangement of the lock proper, the bolt and the parts connected immediately therewith, with the hasps, whereby the portable door lock may be used either as an inside or outside lock.

Second, In combination with the lock, constructed substantially as described, I claim the key made up of the parts, and susceptible of being operated, as set forth.

30,036.—W. B. Atkinson, of Plymouth, Ill., for an Improvement in Mole Plows:

I claim the combination of the V-shaped sharp-pointed mole, E, with the side flange, F, constructed and operating in the manner and for the purpose set forth.

Second, The arrangement of the clamp, K, in combination with the shoe, E, constructed and operating substantially as and for the purpose specified.

[This invention consists in arranging the sharp-pointed shoe or mole with a rounded and narrow bottom, and with an inclined top running up to the flanged back end, in such a manner that the drain formed by the shoe is provided with two shoulders ready to receive the drain boards, and that the sides of the drain are left comparatively unpressed, thus favoring the percolation of water or moisture, and forming at the same time a firm and durable drain, the pressed parts being prevented from returning to their original state from saturation, &c.; also, in the arrangement, on the back end of the shoe, of a clamp to be operated by a screw out from the top of the standard in such a manner that the drain boards can be secured in the shoe and drawn into the drain as the plow passes along through the ground.]

30,037.—Austin Avery, of South Windham, Conn., for an Improved Mode of Attaching Horses to Vehicles:

I claim the metal tubular portion, A, constructed substantially as described, and furnished with a spring latch, b, and slotted hooks, a a, for receiving the T-heads of the shafts and loops, E, for receiving the tug and belly-band straps, as described.

[This invention consists in applying to the ends of short shafts of any one-horse vehicle metal ferules with T-heads on their ends, that are rounding on the bottom and flat on the top, and in attaching these shafts to the ends of metal tubes by slotted eyes and spring bolt or latch joint, which tubes are attached, by a swivel and spring bar, to the hame straps and to the belly-band and breeching straps, in such a manner that by simply detaching the shafts, the horse will be free to walk from the vehicle, as the ends of the shafts are the only part of them to be attached to the harness.]

30,038.—J. R. Babcock, of Canandaigua, N. Y., for an Improvement in Windmills:

I claim the arrangement of a hollow rotary tower, C, with a hollow center, c, in combination with the wind wheel, A, constructed and operating substantially as and for the purpose described.

[This invention consists in combining with a wind wheel a rotary hollow air-tight tower, in such a manner that the same serves as the receiver of air to be compressed by a suitable pump connected to the wind wheel, said tower being provided with a hollow tubular center to draw off the air, which may have been compressed in the same.]

30,039.—A. H. Bartlett, of Spuyten Duyvil, N. Y., for an Improvement in Hot-air Furnaces:

I claim the employment of radiators, e, that are each made with two separate straight legs, having curved extremities, and an arched shoulder with a horizontal neck, e', projecting therefrom, as shown, so that the said radiators may be cast in one piece of metal, and so that when the curved extremities are laid one upon the other a continuous fire flue or radiator of vertical serpentine form is made, the necks, e', serving to facilitate the cleaning of the radiators, besides supporting and strengthening the pile by being laid in the brickwork, all as set forth.

I also claim the special arrangement, as shown and described, of the plates, m m, dome plate, d, fire-pot, b, radiators, e, and flues, f g h, for the purpose specified.

30,040.—Mellen Battel, of Albany, N. Y., for an Improvement in Furnaces:

I claim a coking or drying cylinder, or box, hung on a hollow shaft in the fire box of a boiler, or other furnace, over or above the grate, the shaft being perforated with holes, to allow the atmosphere to pass in by a cock or valve, to commingle with the coal and gases as the cylinder revolves, and necessary to pass from the hollow shaft through the arms to the rim of the cylinder, and then pass out in jets, these cylinders to be revolved at pleasure, substantially as set forth for the purposes described and made to operate.

30,041.—H. Bagley, of Tipton, Iowa, for an Improvement in Mole Plows:

I claim the arrangement of the swivel or oscillating bar, H, upright, G, adjusting screw rod, J, and nut, K, with the adjustable stock, D, beam, A, screw, L, and mole tooth, E, as and for the purpose shown and described.

[This invention consists in passing the coulter or stock to which the mole tooth is attached loosely through the plow-beam, and in adjusting it to the desired position by a jointed brace rod that passes through a transverse swivel shaft suitably supported on the beam, which shaft receives a nut on its end by which the adjustment is effected; and in combination with said contrivance, the invention further consists in the use of a set screw that establishes the stock to the beam in any position to which the stock may be set.]

30,042.—Wm. Beach, of Philadelphia, Pa., for an Improvement in Rammer for Street Paving:

I claim, first, The revolving beater, A, the same being constructed and applied to operate, substantially in the manner and for the purpose set forth and described.

Second, I also claim, in combination with the driving wheels, l l, of the truck, B, the combined arrangement of the differential mechanism, t t' t'', the worm wheel, u, and shaft, u', the same being made to operate together, substantially in the manner and for the purpose set forth and described.

30,043.—George Benjamin, of Avoca, N. Y., for an Improved Lifting Jack:

I claim the combination and arrangement of a lifting apparatus, consisting of uprights, B and B, fulcrum plates, C and C, and clasps, E, and F, provided with latches, G and H, substantially as and for the purpose described.

30,044.—Alfred Brady, of New York City, for an Improvement in Casting Pipe:

I claim the application of a counteracting force to the ends of the core bar, B, in the casting of pipes or tubular work, by means substantially as described and for the purposes set forth.

30,045.—C. F. Brown, of Warren, R. I., for an Improvement in Fire-arms:

I claim the wheel, J, applied in combination with the cam, K, or its equivalent, for the purpose of producing the necessary operation of the said cam, or equivalent, to effect the rapidly repeated firing of a piece of ordnance, by the act of its movement, from place to place, substantially as specified.

[This invention has been patented in foreign countries. An illustration of this novel device is in course of preparation for publication in the SCIENTIFIC AMERICAN.]

30,046.—H. Buckins (assignor to himself and Samuel Petree), of Canton, Ohio, for an Improvement in Milk-straining Pails:

I claim the combination with the pail, A, and spout or channel, E of the removable and sliding strainer, G, arranged to work up and down on the under side of the guard or top-piece, D, as shown and described and for the purposes stated.

30,047.—Moses Bugher, of New Philadelphia, Ohio, for an Improvement in Grain Separators:

I claim, first, The arrangement of the double series of tossing rakes, I I', in combination with the hinged hopper bottom, or delivering board, E, curved rods, j, and shoe, J, constructed and operating substantially as and for the purpose set forth.

Second, The arrangement of the rear extending teeth g, and arms n, extending from the oscillating rake head, F, substantially as described, for the purpose of imparting the desired motion to the delivering board and to the shoe.

Third, The arrangement of the tossing rakes, I I', shoe, J, double conical revolving sieve, L, and an elevator, O, substantially in the manner and for the purpose specified.

[This invention consists in the arrangement of a double series of tossing rakes, in combination with the hinged bottom of the hopper, and with a series of curved wires extending from said hinged bottom or delivering board and with the shoe, in such a manner that the grain as it drops down from the hopper is cleaned from the largest portion of its impurities as it passes over the several rakes and screens; also, in the combination with the tossing rakes and shoe of a double conical, revolving riddle, and an elevator for the purpose of thoroughly separating the grain from all its impurities, and to discharge the good grain into sacks or other receptacles from the top, while the impurities which have been carried down with the grain into the conical riddles are discharged from the bottom.]

30,048.—C. H. Cooper, of New York City, for an Improved Mode of Hanging Torch Lamps:

I claim the infusible metal pivoted joint rivited inside and ontside in the manner and for the purposes set forth.

30,049.—H. R. Crampton, of Lockport, N. Y., for an Improved Bed Bottom Spring:

I claim the spring slats, a a, the binders, c c and s s, the end straps d d, the springs, m m, and the bottom slats, n n, the binders, c c, being hinged as represented, and the several parts constructed and arranged, substantially in the manner and for the purpose specified.

30,050.—A. J. Despinoy, of Lille, France, for an Improvement in the Preparation of Medicinal Extracts:

I claim the new substance produced substantially in the manner described, the same being extracted from the mother liquid of the liver of the sea fish.

30,051.—Jacob Drake, of New York City, for an Improvement in Tapping Water Pipes:

I claim, first, The devisible chamber stuffing box and gland, in combination with the machine, substantially as described.

Second, The equilibrium passage and valves, in combination with the chamber and check valve, substantially as described.

30,052.—Martin Drew, of St. Paul, Minn., for an Improvement in Hames for Horse Collars:

I claim the combination of the extension hames produced by the slides, B, with the variable tug attachment, formed by the notched or bent staples, E, as and for the purpose set forth.

[This invention consists in providing the hames with sides for the purpose of extending the same when necessary to suit different sized collars, and in having the tugs attached to the hames in a novel way, so as to admit of the changing of the draught attachment to suit the size of the horse or the relative position of the hames on the collar.]

30,053.—H. F. Drott, of Cumberland, Md., for an Improved Egg-beater:

I claim the employment of the ganze wire partition, D, in connection with the cup, A, and close-fitting cover, C, the eggs being forced or driven through the partition, substantially as and for the purpose specified.

30,054.—Lewis Evans, of Morgantown, Va., for an Improvement in Molds for Rifle Balls:

I claim, first, Two flasks, A B, of a bullet mold, and a die-carrier, J H, furnished with dies, L, hinged together at C, substantially as and for the purposes set forth.

Second, The combination of a sliding cutter, F, with the flasks, A B, and die carrier, J H, and dies, L, substantially as and for the purposes set forth.

30,055.—James Farnan, of Cleveland, Ohio, for an Improved Faucet:

I claim the cap, B, with its extension, B'', valve, C', cup valve, E, and the valve, G, when these several parts are constructed, arranged and operated substantially as and for the purpose set forth.

30,056.—J. D. Felthousen, of Michigan City, Ind., for an Improvement in Hay and Straw Cutters:

I claim the rockshaft, D, in combination with the stirrup, G, and set screw, F, at the top of the gate, for the purposes substantially as set forth.

I also claim the spring pressure pad or holder, H, with teeth on its lower side, inclining each way from the center to the side of the box, in combination with the knives, I I, substantially as described, and for the purposes indicated.

30,057.—L. B. Flanders, of Cleveland, Ohio, for an Improvement in Marine Propulsion:

First, When two or more propellers are upon the same shaft and rotated in the same direction, I claim arranging the blades of said propellers upon their respective shafts so that the blades of the propeller nearest the bow shall be at a greater angle from the line of the shaft, and the blades of each propeller in the rear of it at a less angle from the line of the shaft, as set forth.

Second, I claim constructing the bearings of the propeller shaft of tables or plates attached to and projecting from the sides of the vessel, as described, so that said bearings constitute cut-water surfaces as well as supporting surfaces, as set forth.

Third, I claim operating the propeller shaft by toothed or beveled wheels projecting through the sides of the vessels, and gearing into toothed or beveled surfaces encircling or upon a band around the propeller, as described.

30,058.—Wm. Fuzzard, of Charlestown, Mass., for an Improvement in Manufacturing Sheets of Fibrous Material:

I claim the taper press box, B, provided with the hesting chambers, E E, one or more, in connection with the feed rollers, C C, or their equivalents, for the purpose specified.

30,059.—R. J. Gatling, of Indianapolis, Ind., for an Improvement in Machine Gearing:

I claim, first, The arrangement of the fixed collar, a, loose washer, c, india-rubber spring, d, loose washer, e, with the female screw, f, and the male screw, f', when used in combination with the cog wheel or pulley, as described, and operated for the purpose set forth.

Second, I claim the enlarged hub or appendage, E, of and to the wheel or pulley, with recess or cavity formed by the flanges, g, in the same, for receiving the caps, D, when constructed and arranged as described, and operated for the purpose set forth.

30,060.—L. S. Graves, of Rochester, N. Y., for an Improvement in Machines for Cutting Boot and Shoe Soles:

I claim, first, The combination with toggle levers, b b, operated as set forth, of the bent lever, H, cutter spindle, g, and reciprocating block, K', carrying the cutter, the lever, J, and rack arm, j', with wheel, i, and its engaging pawl, k—all arranged in a suitable relation to each other and operating as set forth,

Second, The slotted cam drum, D, slotted lever, 3, and adjustable fulcrum screw, 9, with the carriage, 2, and block, 7, movable in the carriage; all combined and arranged in the manner and for the purposes set forth.

Third, The manner of securing the cutter, L, to its holder, N N, by screw rods or rod, P, running lengthwise of the cutter, and blocks, p p, with their pins, p' p', arranged and combined with the slotted and grooved arms of the holder, substantially as set forth.

[This invention is an improvement in machinery for cutting out leather soles. It consists, 1st. In a certain novel combination of toggle levers operated by a connecting rod that receives its motion from a crankshaft, and a vibrating bent lever operated by the toggle levers so as to impart to the cutter stock a vertical, reciprocating movement. It consists, 2d. In the employment of a reciprocating box for carrying the feeders in conjunction with a vibrating lever whose fulcrum is made adjustable, the latter being operated by a cam slide in such a manner as to give a reciprocating movement to the feeders, and, at the same time, an up and down motion to the feeders. It consists, 3d. In a novel manner of securing the sole cutter or die to its stock by screws, wedge blocks and grooves.]

30,061.—E. F. Hamann, of Collikoon, N. Y., for an Improved Barometer:

I claim a tube containing a column of mercury, so balanced or equilibriated that the atmospheric changes produce a greater extent of movement in said tube than the actual change in the altitude of the column of mercury, as set forth.

30,062.—Wm. H. Heald, of Baltimore, Md., for an Improvement in Apparatus for Tanning:

I claim, in combination with a tanning vat, a frame which can move vertically and also turn upon its journals or bearings, and to which the hides are suspended in a perpendicular position while in the tanning liquor, but which, when raised, will, together with the hides, tilt to an inclined or horizontal position, bringing the hides in a pile, substantially as described, and from whence they are readily removed and others attached thereto, as set forth.

30,063.—R. Hemingray, of Covington, Ky., for an Improvement in Molds for Glass Jars:

I claim the mold herein described, for molding such jars as have an annular groove, h, surrounding the mouth of the jar, consisting of the parts, D D, having an angular projection, i, for the purpose of forming the grooves h, so hinged or connected with the parts, A A, of the mold as to open upwardly, while the parts, A A, subsequently open laterally, thus releasing the jar from the mold and permitting the same to be removed without injury, substantially as set forth.

30,064.—M. Heminway, of Watertown, Conn., for an Improvement in Swifts:

I claim the arrangement of the slotted arms, A, and wheel, D, with the hub, G, and spring, J, as and for the purposes set forth and described.

[This invention is an improvement in swifts or reels that are used in silk manufacture, for winding the skeins, as imported, off upon bobbins, consisting in jointing to the periphery of a disk that is keyed to a shaft, six, or more or less arms or spokes that are of an equal length, and which carry on their ends transverse pieces over which the silk is wound, which arms are each attached to a wheel that is placed loosely on the staff, by pins that project from the circumference of the wheel through longitudinal slots in each jointed spoke; the whole to be acted upon by a coiled spring in such a way that the spokes or jointed arms may be adjusted to any diameter best adapted to the length of the skeins of silk to be wound off, and keep the skeins of whatever length, in a proper state of tension during the operation of silk throwing.]

30,065.—J. F. Hunter and F. W. Geissenhainer, of New York City, for an Improved Apparatus for Heating Appartments by Hot Water:

We claim the combination and arrangement of the coils of pipe, G and H, or their equivalent water heating surface, the casing, A, and one or more annular heat radiating vessels, or one or more series of air heating pipes, P, surrounding the same, forming a portable hot water stove substantially of the character above set forth.

We also claim the employment of the cone, K, in the above described hot water stove, arranged relatively to the other parts of the same in the manner and for the purpose set forth.

30,066.—Joshua Jenkins, of Boston, Mass., for an Improvement in Molds for Glass Lamps:

I claim the improved lamp mold as constructed with the auxiliary neck chamber, b, combined with the main matrix and arranged with respect to the mouth or sprue hole, a, substantially as described.

30,067.—Wm. B. Kern, of Middlebourne, Va., for an Improvement in Straw Cutters:

I claim the arrangement of the pressure block, y, spreading spiral spring, x, screw, L, and frame, m, combined with box, A, feed shaft, D, and cutting blades, S, as and for the purpose set forth.

30,068.—Jerome Kidder, of New York City, for an Improved Electro-magnetic Apparatus:

I claim, first, The arrangement of the wires, 12 13 14 14 15 16 17 18 and 19, in combination with the electro-magnet, D, and with the cylinder, A, constructed and operating substantially in the manner and for the purposes set forth.

Second, The arrangement of the wire, 17, in combination with the wire, 13, substantially in the manner and for the purpose set forth.

[The object of this invention is to connect the helices wound around the soft iron core with each other and with the helix of an electro-maguet, in such a manner that the currents produced by the electro-magnetic machine can be used either singly or in various combinations, and also direct or alternating, as may be desired.]

30,069.—S. T. Lamb, of New Washington, Ind., for an Improved Clothes Frame:

I claim, in combination with the series of hinged and folding arms, D E, the lever, H, extending out beyond the frame for the purpose of raising or lowering said frame, substantially as described.

I also claim, in combination with the series of hinged and folding arms, D E, the straining lever, I, with its cord, m, for straining up and holding in a strained up position the clothes lines, substantially as described.

I also claim, in combination with the groove, e, on the spindle, the cut-away key, f, in the pedestal, for the purpose of removing the spindle from the pedestal when necessary, or for locking thereto, but always so that it may turn around, substantially as and for the purpose described.

I also claim, so shaping and arranging the legs, B, on the pedestal that their upper ends shall lock or lap over each other and bear equally on each side of the pivot pin, to prevent their splitting, substantially as described.

30,070.—Joel Lee, of Galesburg, Ill., for an Improved Method of Raising Water from Wells, &c.:

I claim the arrangement of the drum, H, the cords or ropes, B B, the equalizer, C, the valve rod, D, the valve, M, the bumper, E, and the weight, I, with the curb, L, and the bucket, K, provided with spout, A, substantially as and for the purpose specified.

30,071.—Samuel Leonard, of Bridgewater, Mass., for an Improved Spoke-shave:

I claim an improved arrangement of the adjustable mouth-piece and its operative mechanism with respect to the stock, and the cutter arranged in the stock as specified.

30,072.—D. S. Mackey, of Batavia, N. Y., for an Improvement in Machines for Separating and Scouring Grain, &c.:

I claim the arrangement of the suction blast spout, G, with the air chamber, F, spout, N, fan box, B, inclined spout, K, and box, H, as and for the purposes shown and described.

I also claim the arrangement of the stone, L, with the wings or annular plates, m m, bolts, n, curb, J, and bars, M, as and for the purposes shown and described.

[This invention relates to a peculiar arrangement of hulling and scouring stones, curb, blast passages, and air chambers, whereby a very simple, economical and efficient machine is obtained for the desired purpose.]

30,073.—Wm. H. Livingston, of New York City, for an Improvement in Wood Saw Frames:

I claim the combination of the screw rods, E E, loops, F F, or their equivalents, bar, D, and frame, C, applied to the saw frame, A, as and for the purpose set forth.

[The object of this invention is to strengthen the cross-piece of the saw frame, prevent said cross-piece from bending laterally or in a direction at right angles thereto, and also to prevent the winding of the saw frame. The invention also has for its object the straining of the saw in its frame by an equal movement of both end pieces.]

30,074.—W. W. Marsh, of Alton, Ill., for an Improvement in Grate Bars:

I claim the construction of revolving grate bars with alternate longitudinal grooves and pins, and a spiral transverse groove around each bar, by which the edges of the fins are divided into notches and projections spirally arranged, all as herein shown and described for the purpose set forth.

[This invention consists in the construction of revolving and rolling grate bars with longitudinal fins and grooves, so arranged that the fins on each bar may be capable of working into the grooves of the adjacent ones on either side of it, for the purpose of working out the cinders and dust witout disturbing the body of the fire, and with notches in the fins for the purpose of enabling them the better to break up the cinders.]

30,075.—Wm. G. Maupin and J. B. Rooke, of Portsmouth, Va., for an Improved Ship's Air Ports:

We claim the arrangement of the ring, B, and glass, C, with the rings, D, eyes, E E, stem, G, and pipe, A; all as and for the purposes set forth and described.

[This invention is designed to take the place of the circular hinged doors at present used in air ports for vessels which are liable to leak, and which are very inconvenient to manage. The invention and improvement consists in dividing the circular frame in which the glass plates are secured in one, two or three sections, and in operating these glass segments so as to open or close the port by a quarter or half rotary movement; said glass frames being so arranged that a perfectly tight joint will be made, and so that they may be fixed either in an open or partially open state, or in a closed state.]

30,076.—Wm. H. Livingston, of New York City, for an Improvement in Wood Saw Frames:

I claim the combination of the brace rod, E, and metal plate, D, arranged or applied to the saw frame substantially as and for the purpose set forth.

[This invention consists in attaching a metal plate to the cross bar of the saw frame and connecting an adjustable brace to said metal plate and one of the end pieces of the frame, whereby the cross bar of the frame is materially strengthened and prevented from bending in any direction, and the brace rendered capable of being adjusted so that the saw may be properly strained by the movement of both end pieces of the frame, and the symmetry of the latter always preserved.]

30,077.—Wm. E. McIntire, of Salem, Mass., for an Improvement in Safety Stables for Horses, &c.:

I claim the doors, E, springs, G, bar, H, lever bolts, J, and hand lever, K, when the same are combined for joint action and arranged substantially in the manner and for the purposes set forth.

30,078.—Patrick Mihan, of Boston, Mass., and M. A. Lane, of Charlestown, Mass., for an Improvement in Apparatus for Condensation:

We claim the arrangement of the water spaces, C and E, with the tubes, B and k, and with the trumpet-shaped bottoms, c, in combination with the steam space, D, and tubes, b, constructed and operating substantially in the manner and for the purpose set forth.

[The object of this invention is to purify water which is unfit for immediate use, so that the same, after having been separated from its impurities, can be used for drinking or for culinary purposes.]

30,079.—Daniel Moore, of Brooklyn, N. Y., for an Improvement in Revolving Fire-arms:

I claim the center pin, 3, and its collar at the back end, retained within the recess, g, combined with the cylinder, c, and barrel, b, swinging on the gudgeon, 1, in the manner and for the purposes set forth.

And, in combination with said center pin, 3, moving as aforesaid, I claim the latch, i, to retain the parts in place while the arm is being discharged, as specified.

30,080.—Alexander Morton, of New York City, for an Improved Trip Hammer:

I claim, first, The automatic stop mechanism for giving the positive number of strokes required to the hammer, formed by the gearing, D P R S T U, with the peforated disk, V, the tilting shaft, Q, lever, Y, provided with the pin, q, and spring, Z, and bar, B', the latter being arranged relatively with the hammer arm, H, essentially as set forth. The rotary motion of the regulating disk, V, being controlled by the hammer shaft so that the disk is moved simultaneously with the hammer, and the number of blows of the latter regulated by the movement of the former.

Second, The employment or use of the elastic band, O, applied to the hammer arm, H, essentially as and for the purpose set forth.

Third, Forming the hammer arm, H, socket, G, and head, J, separately, and connecting them together by means of the plate, K, and screw rods, h h, the latter being screwed into head, J.

Fourth, The employment or use of the bed, M, provided with a convex face and fitted in the anvil, L, for the purpose set forth.

80,081.—S. W. Mudge, of Rome, N. Y., for an Improved Washing Machine:

I claim the arrangement of the open rotary slatted beater, C, shaft, B, and pinion, j, with the central, hollow, rotating beater, D, rotating disk, g, pinion, i, and driver, E, and for the purpose shown and described.

[This invention relates to an improvement in that class of clothes washing machines in which rotary beaters are used, and consists in the employment of two rotary beaters constructed in a novel way, placed within a suitable stationary tub or case, and arranged to vibrate in opposite directions, whereby the clothes may, without the least injury, be thoroughly cleaned in a very expeditious maner and with a moderate expenditure of power.]

30,082.—George Neilson, of Boston, Mass., for an Improvement in Lamps:

I claim the arrangement and application of the contractile ring with reference to the spring jaws, a a a, and the shaft of the wick elevator, and to operate in manner substantially as described.

I also claim the improved mode of constructing the base part of the conical deflector, viz: with an annular shelf, e, and trough, f, and a series of air inlets, g g, arranged together and with the conical body of the deflector, substantially as specified.

30,083.—Wm. Newell, of Philadelphia, Pa., for an Improvement in Apparatus for Cleaning, Drying and Polishing Coffee:

I claim, in combination with a revolving, double-jacked cylinder with steam space between them, and doors communicating with the interior thereof, the arrangement of the wire rubbing surfaces, F, the flanges, d, radial heating tubes, E, and the flanged longitudinal heating tubes, M, for the purpose and in the manner set forth.

30,084.—John North, of Middletown, Conn., for an Improved Snap Hook for Harness:

I claim a snap hook in which the eye is made in one piece with the tongue, and has a position relative to the bearing point of the hook or that point in which a ring rests, substantially such as is before described.

30,085.—G. M. Norton, of San Francisco, for an Improved Amalgamator:

I claim, first, The combination of the circular annular revolving funnel, G G, with attached pipes, H H H H, with the annular revolving pan, I I, and annular plates, J J and K', to compel the material to traverse from the centers to the circumference, and insure the certainty of its being operated on before it can possibly be discharged at the openings, N M O.

Second, The annular revolving pan, I I, and the annular plates, J J and K, constructed and operated as set forth.

Third, The manner in which the grooves or openings and projection in the different plates are arranged, according to curved lines, as shown in the different drawings, and the manner in which the projecting points, O O, of the plates, J J and K, takes the feed, and forces it from the center as it passes through the pipes, H H, into the mill, causing an eccentric motion in the material under operation, thereby causing it to come repeatedly under the operation of the mill or machine.

Fourth, The manner of adjusting the inside center, I I, with the arms, V V, so as to leave any desired space between the revolving center and bottom of the pan, L L, as well as giving it great facility for being removed and held out of the way whilst cleaning out the mill or machine.

30,086.—B. O'Bryan, of Lancaster, Pa., for an Improved Ore Washer:

I claim the construction and arrangement of the double cone-shaped cylinder, formed of cast iron plates, united as described, and furnished with solid pins and angular shovels on the inside for agitating and advancing the ore to the discharging point, as represented.

30,087.—D. K. Peoples, of Philadelphia, Pa., for an Improved Stern Paddle Wheel:

I claim combining the shaft, A, of a paddle wheel and the horizontal or diagonal engine, which operates the same with the sliding bearing blocks, D and D', the screws, F F, and the system of gearing described, or its equivalent, the whole being arranged and operating substantially as and for the purpose set forth.

30,088.—J. G. Perry, of South Kingston, R. I., for an Improved Meat Cutter:

I claim the combination of a tapering or slanting row of studs with the knives, substantially as and for the purposes set forth.

30,089.—L. T. Pitkin, of Hartford, Conn., for an Improved Frame for Swinging Lamps or Torches:

I claim the solid metal ring, A, and cast with the pivots, B B C C, in the manner and for the purpose substantially as set forth and described.

30,090.—G. P. Plant and J. Raith, of St. Louis, Mo., for an Improvement in Machines for Scouring, Cleaning and Polishing Grain:

We claim the combination of the screen, C, and beaters, k, brushes, j, and feeders, i, when the beaters, brushes and feeders are placed within the screen, C, and the latter made to rotate in a reverse direction to the former, and the screen formed with the three different kinds of perforations, c d e, substantially as and for the purpose set forth.

[This invention consists in the employment or use of a rotating sheet metal screen, constructed in a novel way, and containing within it a revolving beater, brushes and feeders, rotating in a reverse direction to the same; the parts being so arranged as to effectually scour and clean the grain preparatory to grinding the same.]

30,091.—Augustus Reeve, of Alloway stown, N. J., for an Improved Shutter Bolt:

I claim the supplemental socket, I, having a position relatively with the socket, H, as shown, in connection with the bolt, C, provided with a lip, f, and having a rising and falling, or equivalent movement for the purpose specified.

30,092.—George Rosner, of Rochester, N. Y., for an Improvement in Locks:

I claim, first, The attachment to a lock of one or more "secondary locks," for the objects substantially as set forth.

Second, The construction of the "secondary lock" and its attachment to the movable portion of the primary lock, substantially as described.

Third, The independent bearings, K L and M, to the wheels, H I and J, constructed substantially as described.

Fourth, In case of locks requiring an opening in the back, the attachment of a cover to some movable portion of the lock, which cover shall close the opening except when the bolt of the lock is out, for the object substantially as set forth.

Fifth, The construction of the "tumbler," with two independent bearings, one on a disk (as E) revolving with the handle of the lock, the other on the movable wheels, H I, &c., substantially as described.

Sixth, The construction of the tumbler in two parts—the first part capable of motion in a single direction, the second part capable of motion in the same direction as the first part, and also in a direction at an angle (as a right angle), to the motion of the first part, for the object and in the manner substantially as described.

Seventh, The combination of the spring, P, tumbler, O, and projecting cam, p, of the eccentric, F, for the purpose of supporting the tumbler during the greater part of the revolution of the handle of the lock, substantially as described.

Eighth, The construction of the spindle of the lock with a shoulder, for the object substantially as set forth.

30,093.—G. W. Scollay, of St. Louis, Mo., for an Improvement in Glass Molds:

I claim the use of molds for pressing glass coffins in, constructed as shown in Figs. 1 2 3 4 and 5, and substantially as described, the coffin to be made substantially as shown in Fig. 8.

30,094.—D. E. Somes, of Biddeford, Maine, for an Improved Heel for Boots and Shoes:

I claim the described heel made entire in piece, and provided with a flange, B, around its top, pierced with small holes, substantially in the manner and for the purpose specified.

30,095.—L. W. Thickstun, of Chatfield, Minn., for an Improvement in Hanging Window Sashes:

I claim the bolts, I, fitted in the sashes, B B", in connection with the strips, B', in the sashes, and the holes, n, in the stiles, l, of the frame, A, all being arranged for joint operation as and for the purpose specified.

[The object of this invention is to combine a sash stop and weather strip in such a way that the device will operate perfectly in either capacity, and also to use with the sash and weather strip, spring bolts, so arranged as to serve as pivots and admit of the sashes being turned in the frame horizontally for the purpose of washing, ventilation, &c., the stops and weather strips securing the sashes at any part either in their vertical or swinging movement.]

30,096.—Joel Tiffany, of Syracuse, N. Y., for an Improvement in Machines for Hulling Cotton Seed:

I claim the employment of the main rotating roller, formed substantially as described, with pyramidal teeth, by longitudinal and circumferential grooves, when operating in combination with one or more working rollers, having similarly formed teeth, and so arranged and geared that the periphery of the working roller shall travel with greater velocity than the periphery of the main roller, the zones of teeth on the working roller operating opposite the spaces between the zones of teeth on the main roller, substantially as and for the purposes specified.

I also claim, in combination with the main and the working rollers, having a construction and mode of operation substantially such as described, the employment of a range of teeth on one of the bottom edges of the hopper, substantially as and for the purpose specified.

And I also claim, in combination with the main and working rollers, substantially such as above described, the employment of a screen or sieve below them, and a rotating whipping cylinder of teeth below the screen, substantially as described, that the screen may separate the loose hulls from the kernels and that the whipping cylinder of teeth may finally loosen the remaining hulls and fibers, substantially as set forth.

And finally, I claim, in combination, the main and working rollers for hulling, the screen for effecting the first separation, the whipping cylinder of teeth that play between fixed teeth to effect the final loosening of the hulls and fibers from the kernel, and the final screen for effecting the final separation of the kernels from the last fragments of hull and from fibers, substantially as set forth.

30,097.—W. B. Treadwell, of Albany, N. Y., for an Improvement in Stoves:

I claim, first, The employment of the gas cups, C C, with projecting lips above, when the said cups are perforated with small holes, and are provided with an opening through which the products of combustion pass, substantially as specified.

Second, The combination of the cups, C C, with the horizontal flues, E, and the vertical flues, F, the same being used substantially as and for the purpose specified.

Third, The use of the hot air chamber, H, in connection with the cylinder, G, the gas cups, C C, and the flues, E and F, the several parts being employed substantially in the manner and for the purpose set forth.

30,098.—M. B. True, of Newburyport, Mass., for an Improvement in Excavating Machines:

I claim the arrangement of the slotted pivoted lever, G, and adjustable roller, a, with driving shaft, I', wheel, I, head block, E, cutter box, C, and shovel, D, in the manner and for the purposes set forth and described.

I also claim the arrangement of the ratchets, N N, shaft, A, pawls, M M, with the shaft, J', and cams, d d, in the manner and for the purposes set forth and described.

[The object of this invention is to furnish a better means of operating the shovel and hollow cutter of Patent No. 9,309. It consists in the employment of a slotted lever or beam for raising or depressing the cutter box and shovel perpendicularly, or forcing the cutter box into the earth and withdrawing the same therefrom. The invention provides for moving the machine up to the work as the ditching proceeds, and it also provides for regulating the throw of the cutting box for cutting a ditch at any desirable depth.]

30,099.—J. B. Tunison, of Ovid, N. Y., for an Improvement in Grain-cleaning Machine:

I claim, first, Carrying the upper half of the endless slatted belt, E, of my additional separator, over intermediate guide rollers, H I, so that said upper half of the belt be divided into two portions of different inclinations, and another vertical, or nearly vertical, portion between the two, in combination with a fan blower, M, hopper, L, and skeleton bottom, S, substantially as and for the purposes set forth.

Second, Arranging the fan within the endless slatted belt, substantially in the manner and for the purpose described.

30,100.—Wm. Wharton, Jr., of Philadelphia, Pa., for an Improvement in Transferring Cars from one Track to Another:

I claim the described arrangement of the rails, A A1 and A2 and B B', and the curved rail, D, in combination with wheels having simple annular projections, so arranged as to bear against the side only of the said curved rail, as and for the purpose set forth.

30,101.—Ethan Whitney, of Lynn, Mass., for an Improved Folding Case Bedstead:

I claim the described improved manner of constructing the case, A, and applying it to the parts, C D, such being not only particularly useful in supporting the rear part, D, but beneficial as respects not only the turning of the parts, C D, either upward or downward, but in respect to their elevation high enough for the case, A, to receive a washstand underneath the said parts, C D, in manner as described.

I also claim the arrangement of the folding legs, l o p, with respect to the part, C, and a lever, G, applied thereto and operating therewith, substantially as specified.

30,102.—S. L. Wilkinson, of Cross Plains, Tenn., for an Improved System of School Desks:

I claim connecting a series of seats, A A', in a school room by means of boards, a b, running at right angles to the seats, in the manner and for the purposes described.

30,103.—McClintock Young, Jr., of Frederick, Md., for an Improvement in Combined Rake and Reel for Harvesters:

I claim, first, In combination with a continuously revolving inclined reel shaft and a stationary cam, a rake and reel having the corresponding and differential motion set forth while turning with said shaft, substantially as described.

Second, I also claim, in combination with a rake turning on the same shaft with the reel but in a variable path therewith, a counterpoise to prevent said rake from suddenly rising or falling, substantially as and for the purpose described.

30,104.—H. J. Batchelder (assignor to himself and W. F. Eager), of Marlboro', Mass., for an Improvement in Lamps:

I claim the application of a reflector to a lamp cap, substantially as described, by means of the projection, g, extended from the reflector and between the shoulders of such cap, and held in place by the action of the screws thereof, as explained.

30,105.—D. C. Colby (assignor to himself and Edmund Burke), of Newport, N. H., for an Improved Fruit Drying Attachment to Cooking Stoves:

I claim the receiving chamber, B, the perforated partition, C, the central partition, composed of the plates, D D' and E, and the escape flue, H, in combination with the box composed of the wall plates, A A, the top plate, A', and the doors, F F', constructed and arranged as set forth.

30,106.—John Focer (assignor to Whitney Brothers), of Glassborough, N. J., for an Improvement in Tools for Forming Screws in the Necks of Bottles:

I claim forming a screw within the neck of a bottle and shaping the exterior of the neck by means of the rod, E, its screwed portion, e, and the jaws, B B, the latter being arranged to open and close substantially as set forth, and the whole being combined with the devices described, or their equivalents, so that the rod may be readily released or retained for the purpose specified.

30,107.—J. M. Jones, of New Orleans, La., and J. M. Charpentier, of St. Mary's Parish, La., assignors to themselves and A. B. Charpentier, of New Orleans aforesaid, for an Improvement in Bagasse Furnaces:

We claim the employment of a movable grate, E E', applied to a furnace and operating in combination with the fixed grate or bed, B, thereof, substantially as and for the purposes described.

And we also claim the division of the movable grate, E E', into two sections, to run in and out of the furnace on opposite sides thereof, and meet in the middle of the interior thereof, substantially as described.

[The object of this invention is to afford facility for cleaning out the fire chamber of the furnace without stopping its operation, and to provide for the economical use of coal or wood when there is no supply of bagasse or refuse matter at hand; and the invention consists in the employment, for these purposes, of a movable grate, arranged and operating in a peculiar manner in combination with the fixed grate or bed.]

30,108.—H. G. C. Paulsen (assignor to H. N. Fyatt), of New York City, for an Improvement in Refining Sugar:

I claim the application of alcohol of a certain strength in combination with sulphuric ether, in the proportions as stated, and at a degree of heat of the boiling point of said combined liquors, and then of 10° or 15° Fah. above it to raw sugars and molasses, for the purpose of refining and purifying said raw sugars and molasses, as stated.

RE-ISSUES.

Eli Wheeler, of Elmira, N. Y., for an Improvement in Sleeping Cars for Railroads. Patented August 3, 1858:

I claim the use of two cushioned backs, C C, so that they, when standing on edge and resting against the partitions, form, with the bottom cushions, comfortable seats for passengers, and when adjusted so as to lie horizontally on a level with the bottom cushions within the space existing between the two seats, form with the bottom cushions and the partitions, a comfortable enclosed sleeping couch, substantially as set forth.

Henry Lester, of Cincinnati, Ohio, for an Improvement in Roofing Compositions. Patented Jan. 11, 1859:

I claim, first, Saturating the canvas in the mixture or composition described and set forth, under the head of No. 1, and then applying the soapstone, in the manner described, to the saturated canvas.

Second, Covering the soapstoned-saturated canvas with the cements compounded from the heads of Nos. 2 3 and 4 of this specification, the whole being intended to form one composition for roofing and similar purposes, produced from the mixture of the ingredients described, in the proportions and for the purposes set forth.

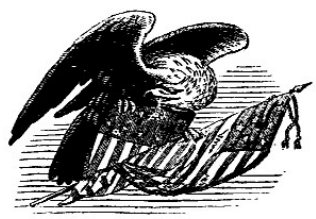
ADDITIONAL IMPROVEMENT.

G. J. Kingsbury, of Rochester, N. Y., for an Improvement in Stoves. Patented April 12, 1859:

I claim the combination and arrangement of the annular channel or groove, f (connected with the air passages, e e), with the fire-pot, A, and surrounding flues, b b, substantially as and for the purposes shown and described.

I also claim the arrangement of the pivoted door, G, with its lower portion extended to form a plane, in combination with the flange, F, for safely supplying fuel to the cylinder, E, when open, and leaving a space for the passage of the products of combustion when closed, substantially as set forth.

THE RISE AND PROGRESS OF INVENTIONS.



During the period of Fourteen Years which has elapsed since the business of procuring patents for inventors was commenced by MUNN & Co., in connection with the publication of this paper, the number of applications for patents in this country and abroad has yearly increased until the number of patents issued at the United States Patent Office last year (1859) amounted to 4,538; while the number granted in the year 1845—fourteen years ago—numbered 502—only about one-third as many as were granted to our own clients last year; there being patented, through the Scientific American Patent Agency, 1,440 during the year 1859. The increasing activity among inventors has largely augmented the number of agencies for transacting such business; and at this time there is scarcely a town of 4,000 inhabitants, but has its patent agent, patent lawyer, patent solicitor, or patent attorney, all of which terms are used to convey the same idea—viz., that their services are offered to the inventor or patentee for a pecuniary consideration.

In this profession, the publishers of this paper have become identified with the universal brotherhood of inventors and Patentees at home and abroad, at the North and the South; and with the increased activity of these men of genius we have kept apace up to this time, when we find ourselves transacting a larger business in this profession than any other firm in the world. Year after year we have increased our facilities for transacting patent business, by gathering around us a large corps of the most eminent engineers, draughtsmen and specification writers that can be procured. Among these gentlemen are those who have been connected with the United States and Foreign Patent Offices. The latest engagement we have made is the association with us of Hon. Charles Mason, formerly COMMISSIONER OF PATENTS, and favorably known to the Inventor as their friend and advocate. The memory of his acts while holding this high position, will be cherished by many an honest inventor with gratitude as long as he lives.

The arrangements made with Judge MASON renders our facilities for prosecuting all kinds of patent business complete, however ample they were before; and without being accused of egotism, we may safely assert that no concern has the combined talent and facilities

that we possess for preparing carefully and correctly applications for patents, and attending to all business pertaining to patents, such as Extensions, Appeals before the United States Court, Interferences, Opinions relative to Infringements, &c.

FREE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable are advised to make a sketch or model of their invention, and submit to us, with a full description, for advice. The points of novelty are carefully examined, and a reply written corresponding with the facts, free of charge. Address MUNN & CO., No. 37 Park-row, New York.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The advice we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there, but is an opinion based upon what knowledge we may acquire of a similar invention from the records in our Home Office. But for a fee of $5, accompanied with a model or drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh streets, Washington, by experienced and competent persons, under the direction of a gentleman who has spent a lifetime about the Patent Office. Over 1,500 of these examinations were made last year through this office, and as a measure of prudence and economy, we usually advise inventors to have a preliminary examination made. Address MUNN & CO., No. 37 Park-row, New York.

CAVEATS.

Persons desiring to fill a caveat can have the papers prepared on reasonable terms, by sending a sketch and description of the invention. The government fee for a caveat is $20. A pamphlet of advice regarding applications for patents and caveats furnished gratis on application by mail. Address MUNN & CO., No. 37 Park-row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention, if susceptible of one; or if the invention is a chemical production, he must furnish samples of the ingredients of which his composition is composed for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the government fee, by express. The express charges should be prepaid. Small models, from a distance, can often be sent cheaper by mail. The safest way to remit money is by draft on New York, payable to Munn & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park-row, New York.

REJECTED APPLICATIONS.

We are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief history of their case, enclosing the official letters, &c.

FOREIGN PATENTS.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we can safely say that three-fourths of all the European patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through our Agency the requirements of the different Patent Offices, &c., may be had gratis upon application at our principal office, No. 37 Park-row, New York, or either of our branch offices.

INTERFERENCES.

We offer our services to examine witnesses in case of interference, to prepare arguments, and appear before the Commissioner of Patents, or in the United States Court, as counsel in conducting interferences or appeals.

For further information, send for a copy of "Hints to Inventors." Furnished free, Address MUNN & CO., No. 37 Park-row, New York,

THE VALIDITY OF PATENTS.

Persons who are about purchasing patent property, or patentees who are about erecting extensive works for manufacturing under their patents, should have their claims examined carefully by competent attorneys, to see if they are not likely to infringe some existing patent, before making large investments. Many persons have been ruined from adopting the "penny-wise and pound-foolish" maxim, when an investment of a few dollars, to have been informed of their rights, would have saved them much anxiety and money. Written opinions on the validity of patents, after careful examination into the facts, can be had for a reasonable remuneration. The price for such services is always settled upon in advance, after knowing the nature of the invention and being informed of the points on which an opinion is solicited. Judge MASON assists in all examinations of this kind.

For further particulars, address MUNN & CO., No. 37 Park-row, New York.

EXTENSIONS OF PATENTS.

Valuable patents are annually expiring which might be extended and bring fortunes to the households of many a poor inventor or his family. During the past fourteen years, we have had much experience in procuring the extension of patents; and, as an evidence of our success in this department, we would state that, in all our immense practice, we never lost but two cases—and those were unsuccessful from causes entirely beyond our control.

It is important that extension cases should be managed by attorneys of the utmost skill to ensure success. All documents connected with extensions require to be carefully drawn up, as any discrepancy or untruth exhibited in the papers is very liable to defeat the application.

Of all business connected with patents, it is most important that extensions should be intrusted only to those who have had long experience, and understand the kind of evidence to be furnished the Patent Office, and the manner of presenting it. The heirs of a deceased patentee may apply for an extension. Parties should arrange for application for an extension at least six months before the expiration of the patent.

For further information, as to terms and mode of procedure in obtaining an extension, address MUNN & CO., No. 37 Park-row, New York.

ASSIGNMENT OF PATENTS.

The assignment of patents and agreements, between patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park-row, New York.

PATENT CLAIMS.

Persons desiring the claims of any invention which has been patented within fourteen years, can obtain a copy by addressing a note to this office, stating the name of the patentee, and date of patent when known, and enclosing $1 as fee for copying. Address MUNN & CO., No. 37 Park-row, New York.

CAUTION TO INVENTORS.

Messrs. MUNN & CO. wish it to be distinctly understood that they neither buy nor sell patents. They regard it as inconsistent with a proper management of the interests and claims of inventors, to participate in the least apparent speculation in the rights of patentees. They would also advise patentees to be extremely cautious into whose hands they entrust the power to dispose of their inventions. Nearly fifteen years' observation has convinced us that the selling of patents cannot be conducted by the same parties who solicit them for others, without causing distrust.

BUSINESS CONDUCTED CONFIDENTIALLY.

We would inform inventors that their communications are treated with the utmost confidence, and that the secrets of inventors confided to us are never divulged, without an order from the inventor or his acknowledged representative.

TESTIMONIALS.

The annexed letters, from the last three Commissioners of Patents, we commend to the perusal of all persons interested in obtaining Patents:—

Messrs. MUNN & Co.:—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill and fidelity to the interests of your employers. Yours, very truly,

CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

Messrs. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you have discharged your duties of Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability and uncompromising fidelity in performing your professional engagements. Very respectfully,

Your obedient servant, J. HOLT.

Messrs. MUNN & Co.:—Gentlemen: It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency, and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully,

Your obedient servant, WM. D. BISHOP.

MODELS BY EXPRESS.

Inventors sending models to our address should always enclose the express receipt, showing that the transit expenses have been prepaid. By observing this rule we are able to prevent the collection of double charges. Express companies, through oversight, sometimes neglect to mark their paid packages, and thus, without the receipt to confront them, we are obliged to pay transit charges in receipt of the model.

It would require many columns to detail all the ways in which the inventor or patentee may be served at our office. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park-row, New York, where any questions regarding the rights of patentees will be cheerfully answered. Communications and remittances by mail, and models by express (prepaid), should be addressed to MUNN & CO., No. 37 Park-row, New York.

Notes and Queries

CORRESPONDENTS sending communications for publication in our columns are requested to avoid writing on both sides of a sheet of paper. This fault, though common to persons unaccustomed to writing for the press, gives great trouble to the printer (especially in long articles), and, when combined with illegibility of handwriting, often causes interesting contributions to be regretfully consigned to our waste-paper basket.

U. D. F., of Texas.—The ore which you send us is iron pyrites.

P. & B., of Texas.—The mineral you send us is evidently mostly iron; but to ascertain how much carbon there is in it would cost more than it is worth.

M. A. W., of Conn —We know of no substance which would give a polish to linen if applied to a wheel buffed with india-rubber. A wheel of polished steel or iron would produce a smooth glaze on starched linen.

W. B. S., of La.—We have little doubt that the mineral enclosed in your letter is iron pyrites; but if you wish to test it, dissolve it in hot nitric acid and drop in a little aqua ammonia, when, if it contains copper, the solution will show a blue color.

OBSERVER, of Ga.—Your statement of the mode in which a buzzard flies is so opposed to the laws of nature, that we think you must have made a mistake in your observations. An inclined descent could not produce sufficient momentum to raise the bird to a point higher that the one from which he started.

G. W. B., of Miss.—As you say, there is no doubt that the "Sulphur showers," as they have been called, are simply pollen from the flowers of trees.

R. M., of Va.—There is no proposition in philosophy plainer to us than that momentum is in proportion to the velocity multiplied by the weight. If you will examine the matter carefully, you will find that your statement is full of errors.

A. S., of N. J.—When a chimney is too wide for the furnace, it frequently happens that descending currents of cold air are started, and the draft is injured. A good remedy is to lessen the opening at the top.

A. S., of Mass.—Wine is made by adding water and sugar to the juice of grapes, and fermenting the whole in a cool place. You will do well to address the Farmers' Club for particulars as to wild grapes.

N. L. W., of N. C.—You need a force pump to raise water 60 feet high from a spring to your house. The ram is only used when there is plenty of water to drive it.

BLACKSMITH, of Pa.—Cast steel may be hardened by plunging it at a red heat into naphtha previously heated to 200°, and, as soon as the naphtha begins to boil, withdrawing the steel and plunging it into cold water. It is stated that this process will make the steel hard, and, at the same time, preserve it from flaws, cracks or twist. Blacksmiths are generally strong enough to take care of themselves.

E. F., Jr., of R. I.—The mineral you send us is a fine specimen of pure plumbago, or black lead. There is a great demand for plumbago, just now, and if you discover a mine of it, your fortune is made.

W. C. B., of N. B.—The pyrotechnists have a great variety of recipes for the charging of rockets. The following is a good one:—Niter, 4 parts; sulphur, 1 part; charcoal, 1¾ part.

E. R. S., of Pa.—Iron is prepared for plating by cleaning carefully, and then depositing on it a film of copper by the battery, from a cyanide solution. It is then ready for gilding, silvering, and bronzing, precisely like copper.

INDICATOR.—There are very few substances which have a boiling point as high as mercury, and the known liquids which have high boiling temperatures are liable to be decomposed while boiling. In any of the school books of chemistry you will find tables of specific heat. But you will not find all you are seeking for in books; the experiments which have been made are quite limited.

J. S., of O.—It is said that two pieces of vulcanized rubber may be joined by using a thick solution of rubber in bisulphide of carbon, to which a small quantity of chloride of sulphur has been added.

L. Y. T., of N. H.—In graining wood, the wood is first painted or stained of a uniform color, and when dry, the grain color is laid on and streaked by drawing over it a wisp of a broom, a comb, or a rag. You will find a list of manufacturers in the New England Directory.

G. M. R., of Mass.—There is no substance known, which interposed between a magnet and a piece of iron, neutralizes the attraction. Perpetual motions and flying would be practicable if we had a substance with such a property.

D. P. N., of Texas.—We think you will have better success if you omit the heating. Oysters should be put up perfectly fresh, and the cans completely filled before the soldering. Gold leaf is attached to varnished surfaces, by means of "gold size," which you can make yourself or purchase of those who deal in varnishes. Pumice stone, glass paper, &c., are used after a coat of varnish, not to polish it or give a gloss, but to make the surface even. The final gloss is given by a coat of thin varnish, or by rubbing with an oiled rag, or by the hand.

MONEY RECEIVED

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, Sept. 22, 1860:—

R. C., of Texas, $185; W. H. R., of N. Y., $250; J. McA., of Ill., $30; F. & H., of Va., $15; J. W. T., of Ala., $25; P. C. P., of N. Y., $25; J. H. B., of Ohio, $25; S. D. S., of Tenn., $[illegible]; G. H., of N. Y., $30; J. R., of Mass., $25; J. B., of N. Y., $30; G. & S. P. G., of Wis., $55; H. McD., of N. Y., $30; J. H. & E. H. A., of Md., $25; E. J. S., of N. Y., $25; W. C., of Pa., $25; A. C., of N. B., $30; M. A. H., of Va., $30; E. C., of N. Y., $30; J. B. S., of Conn., $25; H. B., of N. Y., $25; J. S. S., of N. Y., $25; J. H. H. B., of N. Y., $20; A. C. C., of R. I., $20; G. W. C., of Texas, $55; M. & S., of Ky., $30; T. S., of N. J., $55; C. W. F., of N. Y., $35; S. S., of Kansas, $25; R. & C., of La., $35; H. P., of N. Y., $55; S. J., of N. J., $30; J. H. R., of Tenn., $30; F. H. P., of Conn., $20; D. L., of Pa., $25; J. J. McC., of N. J., $30; J. D., of Ind., $25; I. M. A., of Pa., $30; A. C., of Mass., $25; T. S., of Ohio, $20; P. B., of Mich., $30; D. M., of N. Y., $28; R. W. H., of N. Y., $25; I. B. S., of Conn., $25; J. Y. H. S., of N. Y., $25; P. & T., of Md., $578; W. J. L., of N. Y., $30; L. J., of N. H., $30; J. B., of N. Y., $30; H. W. H., of Ohio, $25; G. W. H., of Pa., $25; E. P. W., of N. Y., $20; I. K., of Ill., $40; F. S., of Ill., $25; W. & G., of Fla., $550; W. P. L., of N. J., $30; J. D., of La., $30; C. H. McC., of Ill., $250; W. S. K., of Conn., $50; E. G. C., of N. Y., $30; W. H. H. M., of N. H., $63; H. G., of Ill., $30; R. T. K., of Pa., $30; W. J. H., of Conn., $30; C. A. W., of N. J., $25; T. S., of N. J., $25; T. S. & J. A. L., of Mo., $55; and $25 by express from Almond, N. Y. Name of sender unknown.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Sept. 22, 1860:—

C. & E., of Ohio; D. F. D., of Ind.; C. A. W., of N. J.; M. W. H., of Ohio; E. I. S., of N. Y.; W. S. K., of Conn. (2 cases); D. L., of Pa.; A. C., of Mass.; J. S. S., of N. Y.; J. Y., of N. Y.; G. W. H., of Pa.; H. B., of N. Y.; S. D. S., of Tenn.; K. & T. C., of N. Y.; J. D., of Ind.; G. W. R., of N. Y.; J. H. B., of N. Y.; H. P., of N. Y.; W. C. W., of Ill.; S. S., of Kansas; J. H. B., of Ohio; J. R., of Mass.; J. P. K., of Texas; J. H. & E. H. A., of Md.; B. & N., of Pa.; M. & B., of Miss.; T. S., of N. J.; J. Y. H. S., of N. Y.; P. C. P., of N. Y.; R. W. H., of N. Y.; I. B. S., of Conn.; F. S., of Ill.; J. W. T., of Ala.

RATES OF ADVERTISING.

THIRTY CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns; and, as heretofore, the publishers reserve to themselves the right to reject any advertisement sent for publication.

PORTER'S IMPROVED GOVERNOR.
The reputation of these governors is well established. Parties troubled with unsteady power may send for them in entire confidence. They never fail.
The numerous valves in use are all equally good, if well made; the form of the opening is immaterial. The governors are warranted to work perfectly with any and all valves, which move freely and close tolerably tight.
A style is made expressly adapted to waterwheels, to which they will give a perfectly uniform motion, under any variation of resistance.
I have long done with troubling my customers for certificates; but am able to refer to a large number of parties now using this governor in a majority of the States of the Union.
I will send a governor to any responsible party for trial. If it does not operate perfectly it may be returned.
A liberal discount to the trade, whose orders will always be promptly filled.
CHARLES T. PORTER,
No. 235 West Thirteenth-street, corner of Ninth-avenue,
14 tf New York City.

300 AGENTS WANTED—TO ENGAGE IN AN honorable business which pays from $3 to $7 per day. Address M. M. SANBORN, Brasher Falls, N. Y. 1*

FULTON'S COMPOUND—WARRANTED TO remove Scale from steam boilers, without injury.
11 4* ASHCROFT & CO., No. 50 John-street, New York.

STEAM BOILER EXPLOSIONS.—ASHCROFT'S Low Water Indicator. No. 50 John-street, New York. 11 4*

BACK NUMBERS AND BOUND VOLUMES OF the NEW SERIES of the SCIENTIFIC AMERICAN can always be had of A. WINCH, No. 339 Chestnut-street, Philadelphia, Pa. 11 12*

STEAM GAGES.—ASHCROFT & CO., NO. 50 John-street, New York. 11 4*

GALVANIZED IRON PIPE—CHEAPER AND better than lead for water. Is used in the cities of Brooklyn and Hartford for water pipes in dwelling houses. Sold at wholesale by JAMES O. MORSE & CO., No. 76 John-street, New York. 10tf

FOR SALE—TWO LARGE TRIP HAMMERS; one new and one second-hand (as good as new). For full description see advertisement in SCIENTIFIC AMERICAN.
3 12* J. C. HOADLEY, Lawrence, Mass.

FOR SALE—A STATIONARY STEAM ENGINE, 7x15, 10-horse power, with boiler and all appurtenances; has been in use three months; in perfect order. An excellent engine. Particulars on application. J. C. HOADLEY, Lawrence, Mass.
3 13*

FOR SALE—A DOUBLE HORIZONTAL STEAM engine, 18x36, 100-horse power; has been in use one year; in perfect order. Three boilers and all appurtenances. Particulars on application. [3 13*] J. C. HOADLEY, Lawrence, Mass.

BARREL HEAD-CUTTERS, PLANERS AND wheel-jointers for sale at the Greenwood Patent Barrel Machine Works, Rochester, N. Y. [7 8*] JNO. GREENWOOD.

SCRUBBING BRUSHES, FLESH BRUSHES, Hand Brushes, Nail Brushes, &c.—For a good valuable article, see illustration on page 400, last volume of the SCIENTIFIC AMERICAN.
2 3

PORTABLE STEAM ENGINES—6, 8 AND 10-horse, at $500, $625 and $780. For sale by S. C. HILLS, No. 12 Platt-street, New York. 1 e3w

NEW SHINGLE MACHINE—THAT WILL RIVE and Shave 24,000 Shingles in a day, for sale by
1 tf S. C. HILLS, No. 12 Platt-street, New York.

GREAT CURIOSITY.—PARTICULARS SENT free. Agents wanted. SHAW & CLARK,
6 24* Biddeford, Maine.

READY THIS DAY.—NEW EDITION, REvised and Enlarged.—"Wells' Every Man his Own Lawyer and United States Form Book." A complete and reliable guide to all matters of business negotiations for every State in the Union, containing simple instructions to enable all classes to transact their business in a legal way without legal assistance. Also, containing the laws of the various States and Territories concerning the Collection of Debts, Property Exempt from Execution, Lien Laws, Laws of Limitation, Laws of Contract, Legal Rates of Interest, License to Sell Goods, Qualifications of Voters, &c., &c. ☞ No man or business woman should be without this work; it will save many times its cost, much perplexity and loss of time. 12mo., 408 pages, law binding; price $1. Sent postpaid. Agents wanted for this and other popular publications. Address JOHN E. WELLS, Publisher, corner of Park-row and Beekman-streets, New York. 25 tf

BROWN & GARRISON'S AGENCY FOR THE sale of Patent Rights and all labor-saving articles, at No. 126 Randolph-street (Post-office box No. 1,219), Chicago, Ill. 13 2*

PORTABLE STEAM ENGINES, COMBINING the maximum of efficiency, durability and economy with the minimum of weight and price. They received the large gold medal of the American Institute, at their late fair, as "the best Portable Steam Engine." Descriptive circulars sent on application. Address J. C. HOADLEY, Lawrence, Mass. 1 22*

PUMPS! PUMPS!! PUMPS!!!—CARY'S IMproved Rotary Force Pump, unrivaled for pumping hot or cold liquids. Manufactured and sold by CARY & BRAINERD, Brockport, N. Y. Also, sold by J. C. CARY, No. 2 Astor House, New York City. 23 13

WROUGHT IRON PIPE, FROM ONE-EIGHTH of an inch to eight inches bore, with every variety of fittings and fixtures, for gas, steam or water. Sold at the lowest market prices by JAMES O. MORSE & CO. No. 76 John-street, New York. 10tf

SOLUBLE GLASS.—FOR BUILDERS, PAINTers, calico printers and soap manufacturers. For rendering wood, cotton, &c., fire-proof; preventing soap from shrinking; also a detergent to guard against dry rot and mildew. Mixed with dolonite, it surpasses all other roofing cements. All kinds of woodwork coated with a solution of soluble glass will be fireproof. Cotton picking rooms, cotton bagging and outhouses can, by a solution of soluble glass, be saved from fire. Manufactured in a dry and liquid form by LEWIS FEUCHTWANGER & SON, No. 42 Cedar-street, New York. Constantly on hand Persian insect powder, oxyds of manganese, tin crystals, chloride of zinc. All rare metals and chemicals for pyrotechnists and calico printers; essential oils and essences. 14 5*

SAVE YOUR STEAM.—HOARD & WIGGIN'S Improved Steam Trap Valve, for relieving steam pipes, cylinders, &c., of condensed water. By its use the boiler pressure is kept up, the full heat maintained, and a large saving in fuel made. Several thousand of these trap valves are in successful use, and we offer them with entire confidence that they will accomplish all that we claim for them. For an illustrated circular of the machines, address—
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14 15 GEO. B. WIGGIN, }

LABORATORY OF CHEMISTRY.—CONSULTAtions and advices on chemistry applied to arts and manufactures, agriculture, metallurgy, mining surveys. Information on chemical fabrications, with drawings, such as colors, varnishes, coal oils, paper, gas, candles, soaps, dyeing, animal black, manures, acids, alkalies, salts, india-rubber, gutta-percha, &c. Address Professor H. DUSSAUCE, chemist (from the Conservatoire Imperial of Arts and Manufactures, Paris), New Lebanon, N. Y. 1*

STEAM BOILER EXPLOSIONS.—NO BOILER should be without a good steam and water gage. An assortment of steam gages from the best makers constantly on hand at their lowest prices, varying from $10 to $30. Purchasers can see them tested for their own satisfaction. Also for sale low water alarms, signal gongs for locomotives, steamboats and city cars, steam whistles, self-cleaning gage cocks, the best in the market; Scotch and Bohemian glass tubes, warranted to stand 500 lbs. pressure; indicators for ascertaining the working horse-power of steam engines, &c. E. BROWN, No. 311 Walnut-street, Philadelphia, Pa. 1*

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J. H. ATWATER, Providence, R. I.
P.S.—Agents wanted. 1*

JONVAL TURBINES—THE SAME IN EVERY respect as the one illustrated on page 164 of the present volume of the SCIENTIFIC AMERICAN, and described by J. E. Stevenson, are made by the undersigned at their manufactory in Paterson, N. J. We have made and put in over 40 of these wheels, and they have given general satisfaction. We can furnish the best of references. Address W. G. & J. WATSON, Paterson, N. J. 14 5*

CHEMICAL MANUFACTURES.—PROFESSOR H. DUSSAUCE, Chemist, having in his possession plans, drawing and recipes for every kind of Chemical Fabrication, offers his services to persons wishing to establish such manufactures. Address to New Lebanon, N. Y. 1*

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INVENTORS' SHOW-ROOM AND MACHINERY depot, No. 43 Greene-street, near Grand, first floor. Steam power and room to let by the week or month; also lofts to let. Inquire in the foundry office, No. 39 Greene-street, New York.
1* A. & E. B. BRADY.

STATE RIGHTS FOR SALE FOR THE MOST simple and efficient foot-scraper ever invented, with or without brush combination. See SCIENTIFIC AMERICAN August 25, 1860; patent No. 29,558. Address E. G. BURGER, Ypsilanti, Mich.; or HENRY E. BURGER, No. 169 Elizabeth-street, New York. 1*

MACHINISTS' TOOLS FOR SALE.—TWO double-geared screw-cutting slide lathes, swinging from 20 to 24 inches and shears 13 to 16 feet long; one double-geared slide lathe, 4 feet diameter and 20 feet in length; four planing machines, various sizes; three card wheel boring machines, three card axle lathes, three shop cranes, &c., &c. All second hand; in good order. Apply to CHAS. W. COPELAND, No. 122 Broadway, New York.
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NOTICE.—WHEREAS APPLICATION HAS been made to the committee (who have advertised extensively, offering premiums for lamps designed for the burning of whale oil) asking further time for the completion of lamps for examination, therefore the committee have extended the time from August 30, 1860, to and including October 1, 1860.
JOS. GRINNELL, Chairman.
MATTHEW HOWLAND, Secretary.
New Bedford, 8th mo. 24th, 1860. 14 4*

LAPHAM'S PATENT STEAM TRAPS—SUPErior to any in use. Warranted to work well under all degrees of pressure. Send for a circular. Address C. A. DURGIN, No. 835 Broadway, New York. 14 8*

Zur Beachtung für Erfinder.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu adressiren an

Munn & Co.,
37 Park Row, New-York.

Auf der Office wird deutsch gesprochen.

THE GRAEFENBERG THEORY AND PRACTICE OF MEDICINE.—On the 1st day of May, 1860, the Graefenberg Company's Sales-rooms, Consulting Offices and Medical Institute were removed from No. 24 Park-row to—
No. 2 Bond-street, New York,
(first door from Broadway,) in order to afford greater facilities and a more central location, demanded by the rapid increase of confidence in the Graefenberg Theory and Practice. The Graefenberg Theory and Practice, and the use of their medicines, together with complete symptoms of all diseases incident to this country and climate, the best method for their prevention and cure, will be found in the "Graefenberg Manual of Health."
This valuable family medical work, containing 300 pages, has been revised and improved, and elegantly illustrated with beautifully colored engravings of the human system. Sent by mail to any part of the country, on receipt of 25 cents. It is a complete guide to all diseases and their cure. Address
JOSHUA F. BRIDGE, M. D.,
Resident and Consulting Physician Graefenberg Co.,
No. 2 Bond-street, New York.
One of the leading journals says of the Graefenberg Manual of Health:—"This is the only medical book for family and general use ever published. It is written in plain language, free from scientific terms, and condenses more practical medical information than can be obtained anywhere else, unless a regular medical course of education is undergone. The popularity of this admirable and compendious work is well shown by this being the twenty-fourth edition. It contains a number of colored anatomical plates, and is a complete family physician. It is at once simple, popular, plain and explicit; and the mother, with such an adviser, is prepared at once to apply the proper remedies in case of sudden sickness in the family. In the country, a copy of the 'Manual of Health' is indispensable, and every family should possess one. It will save a hundred times its cost in doctors' bills, and, what is far better, will be the means of preserving many valuable lives to their families and relatives."
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HARRISON'S GRIST MILLS—20, 30, 36 AND 48 inches diameter, at $100, $200, $300 and $400, with all the modern improvements. Also, Portable and Stationary Steam-engines of all sizes, suitable for said Mills. Also, Bolters, Elevators, Belting, &c. Apply to S. C. HILLS, No. 12 Platt-street, New York. 1 e3w

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1 13 Nos. 37 and 38 Park-row, New York.

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J. A. FAY & CO., WORCESTER, MASS., MAKE the Radius Planer and Machine Spoke-shave, for crooked work and cross-grained lumber. It will chamfer, round, butt and smooth irregular and plane surfaces. Send for circulars. 9 2*

MACHINERY.—S. C. HILLS, NO. 12 PLATT streets, New York, dealer in Steam-engines, Boilers, Planers Lathes, Chucks, Drills, Pumps; Mortising, Tenoning and Sash Machines, Woodworth's and Daniel's Planers, Dick's Punches, Presses and Shears; Cob and Corn Mills; Harrison's Grist Mills; Johnson's Shingle Mills; Belting, Oil, &c. 2 e3w

SWISS DRAWING INSTRUMENTS.—CATAlogue (7th edition), containing over 250 illustrations of Mathematical, Optical and Philosophical Instruments, with attachment of a large sheet representing the genuine Swiss Instruments in their actual size and shape, will be delivered, on application, to all parts of the United States (gratis), by C. T. AMSLER, No. 635 Chestnut-street, Philadelphia, Pa. 6 6*eow

STEAM HAMMERS.—THE UNDERSIGNED, makers of the celebrated Nasmyth hammers, having a full assortment of patterns, continue to furnish them at reduced prices, and of any size, from 5 cwt. upwards. The large number hitherto made by them, and in successful operation, precludes the necessity of presenting any recommendations. They are also patentees and exclusive makers, for this country, of what is generally known as the "Condie," or inverted hammer, one of which of six tons, falling six feet, has been in operation at the Franklin Forge, New York, since 1849. [1 eowtf] MERRICK & SONS, Philadelphia.

DUDGEON'S PORTABLE HYDRAULIC JACKS for raising heavy weights, boilers, locomotives, cars, stone, stowing cotton, pulling, &c. Frames and plates for stationary pressing, of different sizes, made to order. Dudgeon's portable hydraulic punches for punching or shearing iron, die-sinking and other purposes, where, with a limited movement, great power is required. Send for a circular. DUDGEON & LYON, No. 466 Grand-street, New York. 8 13*eow

A MESSIEURS LES INVENTEURS—AVIS IMportant.—Les inventeurs non familiers avec la langue Anglaise et qui préféreraient nous communiquer leurs inventions en Francais, peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront tenues en confidence.
MUNN & CO., Scientific American Office, No. 37 Park-row, New York.

IMPROVED CAR VENTILATOR.

We have the satisfaction of announcing that the intolerable nuisance of dust in railroad cars is about to be abated. The annexed engravings represent a plan for ventilating cars, which is now in practical operation on the New York and New Haven and the Hartford and New Haven railroads, and on the express train between this city and Boston. It operates perfectly, excluding all the dust, and ventilating the car in the most completely successful and satifactory manner. The window was invented by Edward Hamilton, of Bridgeport, Conn., and George Neilson, of Boston, Mass., and the invention was purchased by Nelson Goodyear, who was experimenting with ventilators at the same time. The injector is an old and unpatented device. This invention is the greatest blessing that has been bestowed on the traveling community since the introduction of railroads.

Fig. 1 represents the exterior of the window, the two sides, A and B, being placed at an angle with the side of the car, by which the air is deflected, and produces a strong outward current through the small window, C, which is parallel with the side of the car, and placed between the sloping or angular sides.

Fig. 3 represents the exterior of the injector, several of which are placed upon the roof of the car at the center of its width.

Fig. 4 shows the lower part of the injector as it appears when the cap is removed for the introduction of water.

Fig. 2 is a vertical section of the injector. The force of the air entering at the mouth, E B, moves the hinged flap, C, to the opposite side or mouth, and the air is turned downward in the direction of the arrow, depositing the dust and cinders in the water, while the pure air passes onward and enters the top of the car through the adjustable blind or register, D, from whence it passes to the deflecting window and escapes at the small central door, C.

This system is now in use on the cars of the several roads named above, and the letters of those who have had the longest experience, show conclusively the advantages derived from the adoption of this mode of ventilation which may be stated briefly as follows:—

1. The small central window, C, is readily opened or closed by each passenger, as required.
2. When opened, the person in the rear of the window is not exposed to a draught of air.
3. When the window is open the current of air is outward, and dust cannot enter.
4. In winter, when stoves are in use, the temperature is easily regulated.
5. Neither dust or cold air can enter around the casings of the window, as it does in the windows now in use.
6. In summer, the free passage of air from the windows keeps the air cool.
7. The window frames are made of cast iron, and the glass is not liable to be broken.
8. View of the country is facilitated by the angular position of the glass plates forming the sides of the window.
9. The sill of the window affords a broad space for the arm of the passenger.
10. The heads and arms of passengers are not endangered.

Now that the inventors have done their duty in giving us the means of traveling without being smothered in dust and having our lungs filled with the foul air which has come directly from the throats of our fellow travelers, it is to be hoped that railroad directors and superintendents will have the judgment and enterprise to adopt this great improvement. If they do not care for travelers generally, let them consider that their own lungs, and those of their wives and children, are as liable to be affected by sand and carbonic acid as the lungs of any stranger. On every route where there is competition, the most efficient ventilator must of course be adopted, and we have no doubt that on even monopoly lines the increased travel will more than pay the expense.

More information can be obtained by addressing J. L. Howard & Co., agents and manufacturers, Hartford, Conn.; H. B. Goodyear, New Haven, Conn.; or Woods & Neilson, Boston, Mass.

Fig. 1

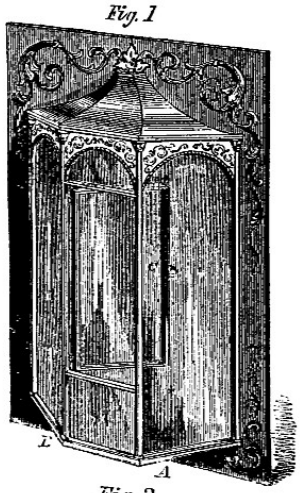


Fig. 2

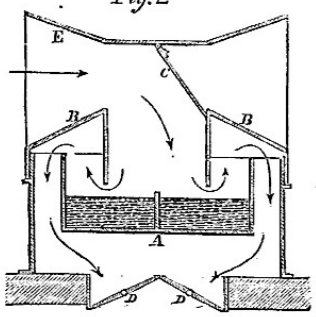


Fig. 3

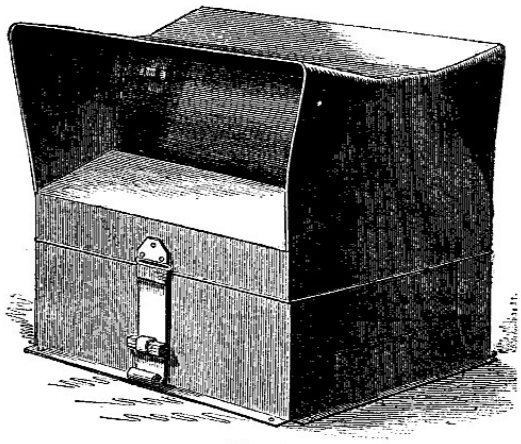
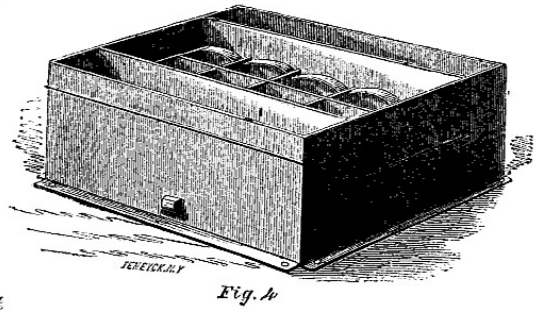


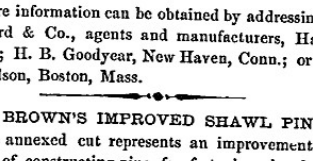
Fig. 4



HAMILTON & NEILSON'S IMPROVED CAR VENTILATOR.

BROWN'S IMPROVED SHAWL PIN.

The annexed cut represents an improvement in the mode of constructing pins for fastening shawls. One end of the pin, A, is soldered to the plate, B, and is coiled into a spring, C, which tends to press the point of the pin against the plate. At the opposite end of the plate is secured the claw, D, with its two prongs inclined as shown, and with one on each side of the needle. The



fabric to which the pin is secured is represented by the dotted line, E; the pin passing through the fabric and returning between the prongs of the claw, which is also hooked through the fabric as shown.

The patent for this simple but probably money-making invention (for frequently these little things are the most profitable) was secured through the Scientific American Patent Agency, March 20, 1860, and further information in relation to it may be obtained by addressing the inventor, Dixen Brown, at Norfolk, Va.

CEMENT FOR HOLES IN CASTINGS.—The best cement for this purpose is made by mixing one part of sulphur in powder, two parts of sal-ammoniac, and eighty parts of clean iron turnings. Sufficient water must be added to make it into a thick paste, which should be pressed into the holes or seams which are to be filled up. The ingredients composing this cement should be kept separate, and not mixed until required for use. It is to be applied cold, and the casting should not be used for two or three days afterwards. Sal-ammoniac is the chloride of ammonium, and these ingredients make a cheap cement.

CIDER—HOW TO STOP IT FROM SOURING.—The following is Professor Horsford's plan for stopping the fermentation of cider at any given point, by which the desired degree of acidity becomes fixed, and the liquid have a pleasant flavor—better than cheap wines:—When the cider in the barrel is undergoing a lively fermentation, add as much white sugar as will be equal to half or three-quarters of a pound to each gallon of cider, and let the fermentation proceed until the liquid attains the right taste to suit, then add an eighth to a quarter of an ounce of sulphite (not sulphate) of lime to each gallon of cider in the cask; first mixing the powder in about a quart of the cider, and then pouring it back into the cask, and giving it a thorough shaking or rolling. After standing bunged up a few days, for the matter added to become incorporated with the cider, it may be bottled or used from the cask.

MECHANICS

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